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SESSIONAL PAPERS.

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SESSION 1900.

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No. 3.. Report of the Commissioner of Crown Lands for the year 1899. Presented to the Legislature, 29th March, 1900. *Printed.*

No. 4.. Report of the Royal Commission, on the Financial position of the Province. Presented to the Legislature, 6th March, 1900. *Printed.*

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No. 5.. Report of the Bureau of Mines for the year 1899. Presented to the Legislature, 25th April, 1900. *Printed.*

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No. 7. Report of the Commissioner of Public Works for the year 1899. Presented to the Legislature, 13th March, 1900. *Printed.*

No. 8.. Report of the Inspectors of Factories for the year 1899. Presented to the Legislature, 6th April, 1900. *Printed.*

No. 9.. Report upon the Registration of Births, Marriages and Deaths in the Province for the year 1899. Presented to the Legislature, 9th March, 1900. *Printed.*

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No. 13.. Reports of Auditor and Standing Committee on Finance for 1899-1900, of the University of Toronto. Presented to the Legislature, 10th April, 1900. *Printed.*

No. 14.. Report of the Ontario Agricultural College and Experimental Farm for the year 1899. Presented to the Legislature, 17th April, 1900. *Printed.*

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No. 15.. Report of the Agricultural and Experimental Union of Ontario for the year 1899. Presented to the Legislature, 26th March, 1900. *Printed.*

No. 16.. Report of the Fruit Growers' Association of Ontario for the year 1899 Presented to the Legislature, 23rd April, 1900. *Printed.*

No. 17.. Report of the Fruit Experiment Stations of Ontario for the year 1899. Presented to the Legislature, 23rd April, 1900. *Printed.*

No. 18.. Report of the Superintendent of Spraying for the year 1899. Presented to the Legislature, 12th March, 1900. *Printed*

No. 19.. Report of the Entomological Society of Ontario for the year 1899. Presented to the Legislature, 21st March, 1900. *Printed.*

No. 20. Report of the Bee Keepers' Association for the Province for the year 1899. Presented to the Legislature, 6th April, 1900. *Printed.*

No. 21.. Report of the Poultry Associations of the Province for the year 1899. Presented to the Legislature, 23rd April, 1900. *Printed.*

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No. 24.. Report of the Superintendent of Farmers' Institutes of the Province for the year 1899. Presented to the Legislature, 23rd April, 1900. *Printed.*

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No. 28.. Report of the Department of Immigration for the year 1899. Presented to the Legislature, 28th March, 1900. *Printed.*

No. 29.. Report of the Inspector of Division Courts for the year 1899. Presented to the Legislature, 12th March, 1900. *Printed.*

No. 30.. Report of the Inspector of Legal Offices for the year 1899. Presented to the Legislature, 9th March, 1900. *Printed.*

No 31.. Report of the Inspector of Registry Offices for the year 1899 with statement of fees and emoluments of Registrars. Presented to the Legislature, 23rd April, 1900. *Printed.*

No 32.. Report of the Provincial Board of Health for the year 1899. Presented to the Legislature, 25th April, 1900. *Printed.*

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No. 34.. Report upon the Lunatic and Idiot Asylums for the Province for the year ending 30th September, 1899. Presented to the Legislature, 6th March, 1900. *Printed.*

No. 35.. Report upon the Common Gaols, Prisons and Reformatories of the Province for the year ending 30th September, 1899. Presented to the Legislature, 13th March, 1900. *Printed.*

No. 36.. Report upon the Hospitals of the Province for the year ending the 30th September, 1899, Presented to the Legislature, 28th March, 1900. *Printed.*

No. 37.. Report upon the Institution for the Education of the Blind, Brantford, for the year ending 30th September, 1899. Presented to the Legislature, 13th March, 1900. *Printed.*

No. 38.. Report upon the Institution for the Education of the Deaf and Dumb, Belleville, for the year ending 30th September, 1899. Presented to the Legislature, 6th March, 1900. *Printed.*

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No. 39.. Report of the Work under the Children's Protection Act for the year 1899. Presented to the Legislature, 15th March, 1900. *Printed.*

No. 40.. Report on the working of the Tavern and Shop Licenses Acts for the year 1899. Presented to the Legislature, 6th March, 1900. *Printed.*

No. 41.. Report of the Provincial Municipal Auditor for the year 1899. Presented to the Legislature, 13th March, 1900. *Printed.*

No. 42.. Return from the Record of the several Elections of the Legislative Assembly in the Electoral Divisions of West Peterborough, South Renfrew, East Elgin, West Elgin, South Brant, and East Middlesex, since the General Election of March 1st, 1898, shewing:—(1) The number of Votes polled for each Candidate in the Electoral District in which there was a contest. (2) The majority whereby each successful Candidate was returned. (3) The total number of Votes polled in each District. (4) The number of Votes remaining unpolled. (5) The number of names on the Voters' Lists in each District. (6) The population of each District as shewn by the last Census. Presented to the Legislature, 20th February, 1900. *Printed.*

No. 43.. Report of the Commission of Enquiry, concerning the operation of the San José Scale Act, 1899. Presented to the Legislature, 12th March, 1900. *Printed.*

No. 44.. Report of the Inspector of Fumigation Appliances for the year 1899. Presented to the Legislature, 12th March, 1900. *Printed.*

No. 45.. Report of the Librarian on the state of the Library. Presented to the Legislature, 14th February, 1900. *Not printed.*

No. 46.. Copy of an Order-in-Council, approved by His Honour the Lieutenant-Governor the thirty-first day of January, 1900, directing that a Commission be appointed to enquire into matters connected with the election for the West Riding of Elgin, and also a copy of the Commission issued thereunder. Presented to the Legislature, 15th February, 1900. *Printed.*

No. 47.. Copy of a Commission appointing Messieurs Hoskin, Walker and Kirkland, Commissioners to enquire into the Financial affairs of the Province of Ontario. Presented to the Legislature, 19th February, 1900. *Printed.*

No. 48.. Report by Prof. James Mavor on Workmen's Compensation for Injuries. Presented to the Legislature, 25th April, 1900. *Printed.*

No. 49.. Copy of Agreement between Her Majesty, represented by the Honourable the Commissioner of Crown Lands, of the one part, and the Blanche River Pulp and Paper Company, Limited, of the other part, and bearing date on the 14th April, 1900. Presented to the Legislature, 23rd April, 1900. *Printed.*

No. 50.. Copy of Agreement with the Spanish River Pulp and Paper Company Limited. Presented to the Legislature, 13th March, 1900. *Printed.*

No. 51.. Awards of the Arbitrators on the Unsettled Accounts between the Dominion of Canada and the Provinces of Ontario and Quebec. Presented to the Legislature, 13th March, 1900. *Printed.*

No. 52.. Statement as to distribution of the Statutes, Revised and Sessional, for the year, 1899. Presented to the Legislature, 7th March, 1900. *Not Printed.*

No. 53.. Return to an Order of the House of the Seventeenth day of March, 1899, for a Return shewing specificially the nature and amount of each investment now outstanding of the moneys or funds of infants and others in Court, the date when each such investment was made, the rate of interest the same bears, when and how payable, and the security held for each of such investments. Presented to the Legislature, 7th March, 1900. Mr. *Carscallen. Not Printed.*

No. 54.. Return to an Order of the House of the Sixth day of March, 1900, for a Return of copies of all correspondence in connection with the appointment of Donald McNiven, as a fishery officer for Lake Simcoe, together with copies of all reports made by him. Presented to the Legislature, 7th March, 1900. Mr. *Thompson. Not Printed.*

No. 55.. Return to an Order of the House of the Seventeenth day of March, 1899, for a Return shewing the total amount of moneys now on deposit in, or subject to the control and distribution of the Supreme Court of Judicature for Ontario, or either division thereof; the style of cause of each action or proceeding in which such moneys have been so paid in, and the County in which each action or proceedings was commenced, as far as practicable, together with the amount now standing to the credit of each such action or proceeding; the names of the persons by whom such payments were respectively made, and on what account, where practicable; the names of and last known addresses of the persons entitled thereto, in all cases in which no payment out of Court has been made within the last ten years, so far as appears by the books and papers in the office of the Accountant of the Supreme Court of Judicature for Ontario, and the amounts due to such persons respectively, so far as appears by the said books. Presented to the Legislature, 9th March, 1900. Mr. *Carscallen. Not printed.*

No. 56.. Regulations *in re* Staking out Locations under Mines Act, in the unsurveyed territory of Ontario. Presented to the Legislature, 12th March, 1900. *Printed.*

No 57.. Reported on Tenders for Departmental and Legislative Printing and Binding, and Contract with Warwick Bro's & Rutter. Presented to the Legislature, 15th March, 1900. *Printed.*

No. 58.. Copy of Order in Council directing the payment of Surplus Surrogate fees to His Honour Judge Doyle. Presented to the Legislature, 16th March, 1900. *Not Printed.*

No. 59.. Return to an Order of the House of the twenty-second day of March, 1899, for a Return of copies of all papers and correspondence between any member of the Government and any individual with respect to the audit asked for by citizens of the Town of Amherstburg, of the accounts of the local collector. Presented to the Legislature, 21st March, 1900. Mr. *Reid, (Addington.) Not Printed.*

No. 60.. Return to an Order of the House of the twenty-first day of March, 1900, for a Return of copies of all instructions issued by the Department to the inspector or commissioners of the County of Grenville, referring to application for hotel licenses in the Village of North Augusta in the County of Grenville, for the last four years, and all reports from the commissioners and inspector in relation thereto. Presented to the Legislature, 22nd March, 1900. Mr. *Joynt*. *Not Printed.*

No. 61.. Copy of an Order-in-Council commuting the Surrogate Court fees payable to His Honour Judge Morson. Presented to the Legislature, 22nd March, 1900. *Not Printed.*

No. 62.. Copy of an Order-in-Council respecting the payment to certain Judges mentioned therein of surplus Surrogate fees. Presented to the Legislature, 22nd March, 1900. *Not Printed.*

No. 63.. Copy of an Order-in-Council directing that the bonds or guarantee policies of certain insurance companies mentioned therein may be given and accepted as security under the Statutes of Ontario. Presented to the Legislature, 22nd March, 1900. *Not Printed.*

No. 64.. Copy of an Order-in-Council commuting the fees of His Honour Judge Barron as Local Master at Stratford. Presented to the Legislature, 22nd March, 1900. *Not Printed.*

No 65.. Analysis of Reports of District, Township, Agricultural and Horticultural Societies for the years 1887, 1888 and 1889. Presented to the Legislature, 28th March, 1900. *Not Printed.*

No. 66.. Return to an Order of the House of the sixteenth day of March, 1900 for a Return of copies of all correspondence in connection with the appointment of Frederick Warren as Division Court Clerk in the Township of Osnabruck in the County of Stormont. Presented to the Legislature, 28th March, 1900. Mr. *McLaughlin*. *Not Printed.*

No. 67.. Return to an Order of the House of the sixth day of March, 1900, for a Return shewing:—

1st. The name and salary of each License Inspector in the Province for the year 1899, and the County for which he was appointed.

2nd. The amount allowed each such Inspector for expenses.

3rd. The names of License Commissioners in each License District and the amount of expenses allowed to each in the year 1899. Presented to the Legislature, 29th March, 1900. Mr. *Marter*. *Not printed.*

No. 68.. Report of the Master of Titles for the year 1899. Presented to the Legislature, 4th April, 1900. *Not printed.*

No. 69.. Return to an Order of the House of the first day of March, 1899, for a Return giving information under the following heads, respecting bonuses and exemptions to manufacturing industries granted by each municipality in the Province since the year 1870:—1. Amount

of aid by way of absolute bonus and the names of firms or companies receiving same. 2. Amount of aid by way of loan, with names of firms or companies receiving same and the amount of such loan or loans repaid to each municipality. 3. Number of factories which have been granted exemptions from taxation in whole or in part, and approximately the amount of such exemption based on municipal assessors' estimate of the rateable property of each industry. 4. Number of firms or companies which have received municipal aid in any form, more than once 5. Number of such firms or companies which have failed or removed from the municipalities which gave them aid by way of bonus, loan or exemption. Presented to the Legislature, 4th April, 1900. Mr. *Pattullo. Not printed.*

No. 70.. Return to an Order of the House of the seventh day of March, 1900, for a Return of copies of all correspondence between the Government or any member thereof, or any official of the Government and the County Crown Attorney of Elgin, or any other person, in connection with the cases of Queen *vs.* Bole, and Queen *vs.* Cahill. Presented to the Legislature, 4th April, 1900. Mr. *McDiarmid. Not printed.*

No. 71.. Return to an Order of the House of the twenty sixth day of March, 1900, for a Return shewing names, or the official numbers, of Boys reprieved from the Penetanguishene Reformatory, and of Girls reprieved from the Industrial Refuge for Girls, Toronto, during the two years previous to the first February, 1900. The date when the reprieve was recommended by the Warden or Superintendent. The date when the reprieve was finally granted. Presented to the Legislature, 4th April, 1900. Mr. *Pyne. Not printed.*

No. 72.. Return to an Order of the House of the sixth day of April, 1900, for a Return, shewing the quantity of binder twine sold during the season of 1899. To whom sold, with names of purchasers and price *per* pound received. Shewing as well, the names of persons still indebted to the Government, and to what amount, in each case. Presented to the Legislature, 6th April, 1900. Mr. *Duff. Not printed.*

No. 73.. Report of the Registrar of Live Stock for the year 1899. Presented to the Legislature, 9th April, 1900. *Printed.*

No. 74.. Commercial Report of the Canadian Section of the Imperial Institute. Presented to the Legislature, 10th April, 1900. *Not printed.*

No. 75.. Return to an Order of the House of the seventh day of March, 1900, for a Return shewing the salary paid to Mr. John Hoskin as Official Guardian. The number and names of the clerks in his office with dates of appointment, and the salary paid by Government to each. Also shewing what other emoluments are received by Mr. Hoskin as such Official Guardian each year, and what amount of other emoulment, if any, was so received or earned by Mr. Hoskin for the year 1899 in his capacity as such official guardian. Presented to the Legislature, 10th April, 1900. Mr. *Whitney. Not Printed.*

No. 76.. Return to an Order of the House of the second day of April, 1900, for a Return shewing amount of Revenue received during the year 1899, by each of the Departments of Government as audited and passed by the Commission appointed to investigate and report as to the Finances of the Province. Presented to the Legislature, 10th April, 1900. Mr. *Miscampbell. Not printed.*

No. 77.. Return to an Order of the House of the sixteenth day of March, 1900, for a Return stating the number of hours female *employés* in factories have to work each day. Also the minimum amount of wages paid *per* day to any female *employé* under the Factory Act. Also, whether separate sanitary conveniences are supplied where male and female *employés* are working, under the Factory Act. And shewing as well what system of Government inspection the factories are now under. Presented to the Legislature, 11th April, 1900. Mr. *Pyne. Not printed.*

No. 78.. Return to an Order of the House of the nineteenth day of March, 1900, for a Return of copies of all correspondence between any member of the Government and any official thereof relating to the distribution of the Statutes. Presented to the Legislature, 18th April, 1900. Mr. *Carnegie. Not Printed.*

No. 79.. Agreement between the Commissioners of the Queen Victoria Niagara Falls Park and the Ontario Power Company of Niagara Falls, dated 11th day of April, 1900. Presented to the Legislature, 17th April, 1900. *Not printed.*

No. 80.. Agreement between Her Majesty, represented by the Honourable the Commissioner of Crown Lands of the first part and The Nepigon Pulp, Paper and Manufacturing Company, Limited, of the other part, bearing date on the 18th April, 1900. Presented to the Legislature, 20th April, 1900. *Printed.*

No. 81.. Return to an Order of the House of the fourteenth day of March, 1900 for a Return shewing the number of dates and places of sittings of the County and Districts Courts, and Courts of General Sessions of the Peace, Oyer and Terminer and General Gaol delivery and of the High Court of Justice, respectively, held in the various county and district towns of the Province, during the years 1895 to 1899, both inclusive:—

(*a*) At which there has been no business to be tried before the petit jury,—

(*b*) At which there has been no action, matter or other proceedings to be tried by a judge without a jury,—

(*c*) At which there have been no indictments laid before the Grand Jury. Presented to the Legislature, 23rd April, 1900. Mr. *Hoyle. Not printed.*

No. 82.. Return to an Order of the House of the fourth day of April, 1900, for a Return of copies of all correspondence and papers, between any member of the Government, or any official thereof, or any other person or persons, in reference to a claim made by the Counties of

Leeds and Grenville against the Government *re* Criminal Justice Account shewing as well, the balance due the Counties. Presented to the Legislature, 23rd April, 1900. Mr. *Joynt*. *Not printed.*

No. 83.. Report of Upper Canada College and Bursars Statement, for the year 1899. Presented to the Legislature, 26th April, 1900. *Printed.*

No. 84.. Return to an Order of the House of the ninth day of April, 1900, for a Return of copies of all correspondence between the License Commissioners or License Inspector for the East Riding of the County of Lambton, or any person, relating to the issuing of a Liquor License in the Village of Thedford for the year 1900. Presented to the Legislature, 26th April, 1900. Mr. *Marter*. *Not Printed.*

REPORT

OF THE

MINISTER OF EDUCATION

(ONTARIO)

FOR THE YEAR

1899

WITH THE STATISTICS OF 1898.

PRINTED BY ORDER OF

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GENERAL REPORT, 1899.

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EDUCATION DEPARTMENT.

MINISTER OF EDUCATION:

HON. RICHARD HARCOURT, M.A., Q.C.

DEPUTY MINISTER OF EDUCATION:

JOHN MILLAR, B.A.

Francis J. Taylor	Chief Clerk and Accountant.
Henry R. Alley,	Clerk and Minister's Secretary.
J. T. R. Stinson,	Senior Clerk.
H. M. Wilkinson,	"
A. C. Paull,	"
F. N. Nudel,	"
W. W. Jeffers,	"
R. J. Bryce,	Junior Clerk.
S. A. May,	"
Thomas Greene,	"
William Lemon,	"
E. A. Faulds,	"
F. Woodley,	"
Miss G. Lewis,	Stenographer.
J. G. Hodgins, LL.D.,	Librarian and Historiographer.
Miss J. M. Crooks,	Assistant Librarian.
S. P. May, M.D., C.L.H.,	Superintendent of Public Libraries and Art Schools.
William Pakenham, B.A.,	Registrar of the Educational Council and Chairman of the Board of Examiners.
David Boyle,	Curator of the Archæological Museum.
L. McCorkindale,	Caretaker.

REPORT

OF THE

MINISTER OF EDUCATION

FOR THE YEAR 1899

WITH THE STATISTICS OF 1898.

To the Honorable Sir Oliver Mowat, K.C.M.G.,
Lieutenant-Governor of the Province of Ontario.

May it Please Your Honor:

I herewith present the Report of the Education Department for the year 1899, together with the statistics for the year 1898.

SUMMARY OF STATISTICS.

* *Elementary Schools.*

Number of Public Schools		5,587
Increase for the year	13	
Number of Roman Catholic Separate Schools		345
Increase for the year	5	
Number of Protestant Separate Schools		8
Number of Kindergartens		116
Number of teachers		240
Number of Night Schools		18
Number of teachers		42
Amount expended for Public School Houses (sites and buildings)		$426,422
" " Public School teachers' salaries		$2,747,159
" " all other purposes		$869,652

* The Curriculum of Elementary Schools embraces the following subjects: Reading, Writing, Arithmetic, Composition, Drawing, English Literature, Geography, Music, Grammar, History, Physiology and Temperance, Drill and Calisthenics, Bookkeeping, Algebra, Geometry, Botany, Elementary Physics, Agriculture.

Total amount expended on Public Schools		$4,043,223
Increase	$129,732	
Number of persons in the Province between the ages of 5 and 21		591,300
Increase for the year	1,245	
Number of registered pupils of all ages in the Public Schools during the year		436,727
Decrease for the year	4,430	
Average attendance of pupils in the Public Schools during the year		247,780
Decrease for the year	768	
Number of pupils in Roman Catholic Separate Schools		41,667
Increase for the year	47	
Average attendance of pupils in Roman Catholic Separate Schools		25,671
Increase for the year	675	
Number of pupils in Protestant Separate Schools		505
Decrease for the year	38	
Average attendance of pupils in Protestant Separate Schools		266
Decrease for the year	55	
Number of pupils attending Kindergartens		11,083
Increase for the year	390	
Average attendance of pupils at Kindergartens		4,573
Increase for the year	211	
Number of pupils attending Night Schools		1,504
Increase for the year	98	
Average attendance of pupils at Night Schools		363
Increase for the year	46	
Percentage of average attendance to total attendance in Public Schools		57
Number of persons employed as teachers in the Public Schools during the year:		
Men, 2,656; women, 5,809; total		8,465
Decrease: men, 34; increase: women, 123; increase	89	
Number of teachers who have attended a Normal School		3,585
Increase for the year	106	
Number of teachers who have attended a County Model School in 1899		1,271
Average annual salary of male teachers in Public Schools		$396
Increase for the year	$5	
Average annual salary of female teachers in Public Schools		$293
Decrease for the year	$1	

* *Secondary Schools.*

Number of High Schools (including 37 Collegiate Institutes)		130
Number of teachers in High Schools		571
Decrease for the year	8	
Number of pupils in High Schools		23,301
Decrease for the year	1,089	
Amount expended for High School teachers' salaries		$531,887
" " houses (sites and buildings)		$52,266
" all other High School purposes		$144,856
Total amount expended on High Schools		$729,009

* The Curriculum of Secondary Schools includes all the subjects required for matriculation into the University.

I.—PUBLIC SCHOOLS.

1.—School Population—Attendance.

School Population.

The school population of the Province, as ascertained by the assessors, is as follows:

Year.	School age.	School population.	Pupils registered, under 5.	Pupils registered, 5 to 21.	Pupils registered, over 21.	Total number of registered pupils.	Average attendance.	Percentage of average attendance to total number attending school.
1867	5—16	447,726	.....	*380,511	†21,132	401,643	163,974	41
1872	5—16	495,756	.....	*433,664	†20,998	454,662	188,701	42
1877	5—16	494,804	1,430	488,553	877	490,860	217,184	44
1882	5—16	483,817	1,352	469,751	409	471,512	214,176	45
1887	5—21	611,212	1,569	491,242	401	493,212	245,152	50
1892	5—21	595,238	1,636	483,643	391	485,670	253,830	52
1897	5—21	590,055	1,385	481,120	272	482,777	273,554	56
1898	5—21	591,300	1,387	476,584	223	478,194	273,451	57

* 5—16 † Other ages.

Note.—The Minister's Report (for purpose of comparison with previous years in which the R. C. Separate Schools were included with Public Schools) includes R. C. Separate Schools. In the Statistical Tables, A, B, C, D, E, the Separate Schools are excluded.

2.—Classification of Pupils.

Year.	1st Reader—Parts I. and II.	2nd Reader.	3rd Reader.	4th Reader.	5th Reader.	Writing.	Arithmetic.	Drawing.	Geography.	History.	Music.	Grammar and Composition.	Temperance and Hygiene.
1867 ..	79,365	98,184	83,211	68,896	71,987	231,734	241,501	5,450	272,173	61,787	47,618	147,412	.....
1872 ..	160,828	100,245	96,481	67,440	29,668	322,688	327,218	57,582	327,139	109,639	110,083	282,156	.....
1877 ..	153,630	108,678	135,824	72,871	19,857	396,006	402,248	153,036	375,951	116,865	168,942	226,977	.
1882 ..	165,834	106,229	117,352	71,740	10,357	398,101	419,557	176,432	280,517	150,989	158,694	209,184	33,926
1887 ..	192,361	100,533	108,096	81,984	10,238	466,389	469,445	395,097	316,791	194,754	203,567	570,856	71,525
1892 ..	187,947	96,074	99,345	88,934	13,370	465,516	470,813	435,239	334,947	253,956	220,941	294,331	171,594
1897 ..	181,375	91,330	99,682	89,314	21,076	465,525	471,869	448,444	342,189	284,025	233,915	316,787	215,343
1898 ..	179,360	90,624	97,693	89,670	20,847	464,460	469,603	447,813	343,759	284,153	245,370	313,637	219,776

From the statistics given it will be seen that the number of pupils in the 3rd and 4th Forms has been steadily increasing. There is also a very gratifying increase in the number studying History, Geography, Grammar and Composition. The provisions in the

regulations of 1885, whereby Canadian history was made compulsory for entrance to the High Schools, has led no doubt to a better knowledge of these great events which affect the destiny of the Dominion, and which cannot fail, on account of their importance, to be stimulating to the patriotism of all pupils attending the schools of the Province.

Temperance and Hygiene.

It is also worthy of notice that the number of pupils receiving instruction in Temperance and Hygiene has increased from 33,926, in 1882, to 219,776, in 1898. Having regard to the great importance of the knowledge of physiology and the injurious effects of alcoholic stimulants on the human system, provision was made by the statute in 1886 for placing this subject on the course of study for Public Schools. Instruction was also provided under departmental regulation for teachers in-training at County Model Schools and Normal Schools, to be followed by an examination as an essential pre-requisite to their final recognition as duly qualified teachers. In 1893, this subject was made compulsory for entrance to High Schools and Collegiate Institutes, so that no pupil who pursues his studies as far as the 5th Form can fail to be reasonably well acquainted with the conditions on which his health and physical vigor depend, as well as with the dangerous tendency of stimulants and narcotics to prodnce weakness and disease.

Kindergartens.

The system of Kindergarten instruction, first introduced into Ontario in 1882, and subsequently made part of the School System of the Province, by the Public Schools Act of 1885, has met with encouraging success. A report of the pupils receiving instruction in this way was first made in 1892. The report showed that in the short space of ten years, 69 Kindergartens were established, with 160 teachers, attended by 6,375 children under six years of age. In 1898 the number of Kindergartens had increased to 116, with 240 teachers, attended by 11,083 pupils under six years of age.

Night Schools.

The whole number of Night Schools aided in 1898 was 18, the number of teachers 42, and the number in attendance 1,504. This number does not include the attendance upon the classes established by Mechanics Institutes and Art Schools.

3. Teachers' Certificates and Salaries.

Teachers' Certificates.

Year.	Public school teachers.	Male.	Female.	1st class.	2nd class.	3rd class.	Other certificates, Including old County Boards, etc.	Number of teachers who attended Normal Schools.
1867.....	4,890	2,849	2,041	1,899	2,454	386	151	666
1872.....	5,476	2,626	2,850	1,337	1,477	2,084	578	828
1877.....	6,468	3,020	3,448	250	1,304	3,926	988	1,084
1882..... ..	6,857	3,062	3,795	246	2,169	3,471	971	1,873
1887.....	7,594	2,718	4,876	252	2,553	3,865	924	2,434
1892.....	8,480	2,770	5,710	261	3,047	4,299	873	3,038
1897	9,128	2,784	6,344	343	3,386	4,465	934	3,643
1898....	9,209	2,743	6,466	450	3,456	4,364	939	3,875

Teacher's Salaries.

Year.	Highest salary paid.	Average salary, male teacher, province.	Average salary, female teacher, province.	Average salary, male teacher, counties.	Average salary, female teacher, counties.	Average salary, male teacher, cities.	Average salary, female teacher, cities.	Average salary, male teacher, towns.	Average salary, female teacher, towns.
	$	$	$	$	$	$	$	$	$
1867	1,350	346	226	261	189	532	243	464	240
1872	1,000	360	228	305	213	628	245	507	216
1877	1,100	398	264	379	251	735	307	583	269
1882	1,100	415	269	385	248	742	331	576	273
1887	1,450	425	292	398	271	832	382	619	289
1892	1,500	421	297	383	269	894	402	648	298
1897	1,500	391	294	347	254	892	425	621	306
1898	1,500	396	293	346	250	888	448	626	291

4. Receipts and Expenditure.

Year.	Receipts.				Expenditure.					
	Legislative grants.	Municipal school grants and assessments.	Clergy reserve funds, balances and other sources.	Total receipts.	Teachers' salaries.	Sites and building school houses.	Maps, apparatus, prizes, etc.	Rent, repairs, fuel and other expenses.	Total expenditure.	Cost per pupil.
	$	$	$	$	$	$	$	$	$	$ c.
1867	187,153	1,151,583	331,599	1,670,335	1,093 517	149,195	31,354	199,123	1,473,189	3 67
1872	225,318	1,763,492	541,460	2,530,270	1,371,594	456,013	47,799	331,928	2,207,364	4 85
1877	251,962	2,422,432	730,687	3,405,081	2,038,099	477,393	47,539	510,458	3,073,489	6 26
1882	265,738	2,447,214	757,038	3,469,990	2,144,449	341,918	15,583	525,025	3,026,975	6 42
1887	268,722	3,084,352	978,283	4,331,357	2,458,540	544,520	27,509	711,535	3,742,104	7 59
1892	283,791	3,300,512	1,227,596	4,811,899	2,752,629	427,321	40,003	833,965	4,053,918	8 40
1897	366,538	3,361,562	1,260,055	4,988,155	2,886,061	391,680	60,585	887,335	4,215,670	8 73
1898	367,010	3,537,352	1,315,083	5,219,444	2,914,830	529,508	63,298	885,078	4,392,714	9 19

II.—ROMAN CATHOLIC SEPARATE SCHOOLS.

Year.	Schools—Expenditure—Teachers.				Number of pupils attending—Number of studies.							
	School open.	Total receipts.	Total expenditure.	Teachers.	Pupils.	Reading.	Writing.	Arithmetic.	Geography.	Grammar.	Drawing.	Temperance and hygiene.
1867	161	48,628	42,719	210	18,924	18,924	10,749	10,559	8,666	5,688	.....	.....
1872	171	68,810	61,817	254	21,406	21,406	13.699	12,189	8,011	7,908	.....	.....
1877	185	120,266	114,806	334	24,952	24,952	17,932	17,961	13,154	11,174	.....	.....
1882	190	166,739	154,340	390	26,148	26,148	21,052	21,524	13,900	11.695	7,548	2,033
1887	229	229,848	211,223	491	30,373	30,373	27,824	28.501	19,608	18,678	21,818	8,578
1892	312	326,034	289,838	662	37,466	37,466	35,565	35,936	26,299	22.755	32,682	11,056
1897	340	335,324	302,169	752	41,620	41,620	39,724	40,165	27,471	26,071	36,462	18,127
1898	345	389,185	349,481	744	41,667	41,667	41,473	41,396	29,578	24,138	37,345	17,964

III.—PROTESTANT SEPARATE SCHOOLS.

The complete list of Protestant Separate Schools is as follows :

No. 5 Bromley, No. 9 Cambridge, No. 1 Marlboro', No. 6 Plantagenet North, Puslinch, Rama, L'Orignal, Penetanguishene.

They were attended by 505 pupils. The whole amount expended for their maintenance was $4,895. One teacher held a First Class, five a Second Class, five a Third Class, and one a Temporary Certificate.

IV.—HIGH SCHOOLS.

(*Including Collegiate Institutes.*)

1.—Receipts, Expenditure, Attendance, Etc.

The following statistics respecting High Schools will be found suggestive :

Year.	School Open.	Teachers.	Receipts.			Expenditure.			Pupils.	Percentage of average attendance to total attendance.	Cost per pupil.
			Amount of fees.	Legislative grant.	Total Receipts.	Paid for teachers' salaries.	Paid for sites and building school houses, rents and repairs.	Total expenditure.			
			$	$	$	$	$	$	$	$	$
1867.....	103	159	15,605	54,562	134,579	94,820	19,190	124,181	5,696	55	21 80
1872.....	104	239	20,270	79,543	223,269	141,812	31,360	210,005	7,968	56	26 36
1877.....	104	280	20,753	78,762	357,521	211,607	51,417	343,710	9,229	56	37 24
1882.....	104	332	29,270	84,304	373,150	253,864	19,361	343,720	12,348	53	27 56
1887.....	112	398	56,198	91,977	529,323	327,452	73,061	495,612	17,459	59	28 38
1892.....	128	522	97,273	100,000	793,812	472,029	91,108	696,114	22,837	60	30 48
1897.....	130	579	110,859	101,250	767,487	532,837	46,627	715,976	24,390	61	29 35
1898.....	130	571	104,486	100,203	779,451	531,887	52,266	729,009	23,301	60	31 54

2.—Classification, Etc.

Year.	English.					Mathematics.				Science.		
	English Grammar and Rhetoric.	English Composition	Poetical Literature.	History.	Geography.	Arithmetic and Mensuration.	Algebra.	Geometry.	Trigonometry.	Physics.	Chemistry.	Botany.
1867..	5,467	4,091	.....	4,634	5,264	5,526	2,841	1,847	141	1,876	840	.....
1872..	7,884	7,278	.....	7,513	7,715	7,834	6,033	2,592	174	1,921	1,151	.....
1877..	8,819	8,772	.....	9,106	9,158	9,227	8,678	8,113	359	2,168	2,547	.....
1882..	12,275	12,189	.....	12,220	12,106	12,261	11,742	11,148	397	2,880	2,522	.....
1887..	17,086	17,171	16,649	17,010	16,962	16,939	16,904	14,839	1,017	5,265	3,411	4,640
1892..	22,530	22,525	22,468	22,328	22,118	21,869	22,229	17,791	1,154	6,601	3,710	6,189
1897..	19,591	24,195	24,176	18,318	13,747	19,798	24,105	16,788	1,652	11,002	5,489	12,892
1898..	17,671	22,986	23,067	18,696	11,856	17,751	22,835	16,439	1,409	10,296	5,391	11,375

CLASSIFICATION, ETC.

Year.	Languages.				Drawing.	Vocal Music.	Bookkeeping and commercial transactions.	Left for mercantile life.	Left for agriculture.	Who joined learned profession.	Matriculated.	Number of schools charging fees.
	Latin.	Greek.	French.	German.								
1867.....	5,171	802	2,164	.....	676	.....	1,283	.....	.....	.....	56	57
1872.....	3,860	900	2,828	341	2,176	.....	3,127	486	300	213	78	28
1877.....	4,955	871	3,091	442	2,755	.....	3,621	555	328	564	145	35
1882.....	4,591	815	5,363	962	3,441	.....	5,642	881	646	751	272	37
1887.....	5,409	997	6,180	1,350	14,295	1,955	14,064	1,141	882	791	305	58
1892.....	9,006	1,070	10,398	2,796	16,980	948	16,700	1,111	1,006	398	471	77
1897.	16,873	1,421	13,761	5,169	12,252	160	11,647	1,368	1,153	409	652	87
1898.....	19,313	1,456	13,866	6,288	10,947	30	11,026	1,491	1,050	499	837	79

Classification.

From a study of the classification of High Schools and Collegiate Institutes, two or three very striking changes in the tendency of higher education may be worthy of notice. For instance, in 1867, only 1,283 pupils, or 23 per cent. of the whole number, studied commercial subjects, such as Bookkeeping; in 1898 this subject was taken by 11,026 pupils, or 47 per cent. of the whole attendance. In 1867, 5,171 pupils, or 90 per cent. of the whole attendance, studied Latin; in 1898 the number of pupils in Latin was 19,313, about 83 per cent. of the number in attendance. In 1867, 15 per cent. studied Greek; in 1898, only six per cent. were engaged in studying this subject. In 1867, 38 per cent. of pupils studied French, and none studied German; in 1898 these numbers had increased to 60 per cent. and 27 per cent. respectively. There also has been a large increase in the number studying Drawing, the total in 1867 being 676, and in 1898, 10,947.

Diffusion of High School Education.

When the High School System of the Province was first inaugurated, its primary object was to prepare pupils for the learned professions, and especially for the University. While in that respect our High Schools amply fulfil their original purpose, in later years the course of education which they provide has been considered a desirable qualification for various other pursuits in life. Many young men in preparing for mercantile life or for agriculture take advantage of the High School, perhaps not so much because of the direct training which it gives for their intended calling as for the superior culture which it provides. In 1872, 486 High School pupils, when they had finished their High School education, entered mercantile life. In 1898 the number had increased to 1,491. Similarly, 300 High School pupils left the High School for agricultural pursuits, and in 1898, 1,050 pupils pursued a similar course. In all, the High Schools gave to mercantile life and to agriculture in 1898, 2,541 pupils of well recognized educational standing, and to the Universities and learned professions the same year, 1,336. The whole number who left the High School for mercantile life since 1872 was 24,094, and for agriculture, 18,920

Occupations of Parents of High School Pupils.

Agricultural	8,714
Commercial	6,334
Mechanical	5,866
Professional	2,387

V.—DEPARTMENTAL EXAMINATIONS.

Entrance Examinations, 1877-1899.

Year.	No. of candidates examined.	No. of candidates who passed.
1877	7,383	3,836
1882	9,607	4,371
1887	16,248	9,364
1892	16,409	8,427
1897	16,384	10,502
1898	16,861	9,611
1899	16,309	10,604

Public School Leaving Examinations, 1892-99.

Year.	No. of candidates examined.	No. of candidates who passed.
1892	432	195
1893	539	268
1894	2,021	690
1895	2,630	1,395
1896	3,239	1,826
1897	4,578	2,242
1898	5,280	1,980
1899	4,368	2,825

Departmental and Matriculation Examinations.

| Year of examination. | No. of candidates examined. | No. of successful candidates. | | |

Table showing the number of Teachers-in-Training at County Model Schools, Normal College, Provincial Normal Schools, etc.

Year.	County Model Schools.			Normal College.			Normal and Model Schools, etc.					
	No. of schools.	No. of teachers-in-training.	No. that passed final examination.	No. of teachers.	No. of students.	Receipts from fees of Normal College.	No. of Normal School teachers.	No. of Normal School students.	No. of Model Schools and Kindergarten teachers.	No. of Model Schools and Kindergarten pupils.	Receipts from fees of Normal Schools, Model Schools, and Kindergarten pupils.	Expenditure, Normal and Model Schools.
						$ c.					$ c.	$ c.
1877....	50	1,146	1,124	.....	....	.....	13	257	8	643	7,909 22	25,780 88
1882....	46	882	837	.....	.....	.....	16	260	15	799	13,783 50	44,888 02
1887....	55	1,491	1,376	.....	.....	.....	13	441	18	763	16,427 00	40,188 66
1892....	59	1,283	1,225	10	96	1,630 00	12	428	22	842	19,016 00	45,724 12
1897....	60	1,645	1,384	12	180	4,374 00	13	447	23	832	18,797 59	46,390 91
1898....	60	1,288	1,166	12	176	2,600 00	10	458	24	858	20,587 41	46,949 63
1899....	61	1,271	1,158	12	148	1,845 00	10	478	25	863	19,903 00	46,855 03

Examination Papers issued, 1899.

The number of examination papers issued by the Department in 1899 was:

High School Entrance.....	277,000	Third Class (County Model Schools).....	18,000
Form I	34,500	Second Class (Provincial Normal Schools).....	11,200
Form II.....	34 000	Commercial Specialists.....	5,600
Form III.....	85,000	Commercial Diplomas.....	3,200
Form IV.....	60,000		
Public School Leaving	146,500		
Normal College	12,800		
Art Schools	10,700	Total	706,500
Kindergartens	8,000		

VI.—TEACHERS' INSTITUTES

This table presents the work of Teachers' Institutes for twenty one years:

Year.	Receipts.							Expenditure.	
	No. of Teachers' Institutes.	No. of members.	Total No. of teachers in province.	Amount received from Government grants.	Amount received from municipal grants.	Amount received from members' fees.	Total amount received.	Amount paid for libraries	Total amount paid.
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1877.....	42	1.181	6,468	1,412 50	100 00	299 75	2,769 44	.....	1,127 63
1882.....	62	4,395	6,857	2,900 00	300 00	1,088 84	9,394 28	453 02	5,355 33
1887.....	66	6,781	7,594	1,800 00	1,879 45	730 66	10,405 95	1,234 08	4,975 50
1892.....	69	8,142	8,480	1,950 00	2,105 00	875 76	12,043 54	1,472 41	6,127 46
1897.....	73	7,627	9,128	2,425 00	2,017 45	901 15	12,446 20	1,479 88	6,598 84
1898.....	75	8,238	9,209	2,650 00	1,857 50	876 25	12,629 49	1,526 84	6,730 60

VII. TECHNICAL EDUCATION,—PUBLIC AND FREE ART SCHOOLS AND LITERARY AND SCIENTIFIC INSTITUTIONS.

The Act and regulations respecting Public Libraries and Art Schools, was revised and amended in 1899. The principal changes are ;

1. The official year for Public Libraries, which formerly commenced on the 1st of May, and ended on the 30th of April, in each year, will in future commence on the 1st of January and end on the 31st of December in each year. The annual reports from Public Libraries for 1899 will show only eight months' work, viz., from the 1st of May, 1899, to the 31st of December, 1899, but the Government grant will be paid for books the same as if the libraries had been in operation twelve months.

2. The date for holding annual meetings for electing boards of management for Public Libraries established under the Act respecting Mechanics' Institutes and Art Schools, which are maintained by members and other sources, is changed to the first Monday in January in each year ; but when such libraries are taken over by municipalities and made free, the first appointments of members to the board of management are made at the first meeting of the appointing council or board, the annual appointments thereafter are made at the first meeting of the appointing council, or board, after the first day of January in each year.

The following abstracts from the report of the superintendent of this branch of the Education Department shows a marked success and great progress in Public Libraries, Art Schools and Scientific Institutions.

I. PUBLIC LIBRARIES.

1. Abstract showing Number of Public Libraries in each County and District.

Name.	No.	Name.	No.	Name.	No.	Name.	No.	Name.	No.
Addington	6	Frontenac	3	Lambton	12	Northumberland	9	Renfrew	9
Algoma	11	Glengarry	3	Lanark	8	Ontario	12	Russell	2
Brant	6	Grenville	9	Leeds	4	Oxford	12	Stormont	1
Bruce	22	Grey	17	Lennox	1	Parry Sound	6	Simcoe	15
Carleton	8	Haliburton	1	Lincoln	6	Peel	13	Victoria	12
Dufferin	10	Haldimand	10	Manitoulin Isl'nd	2	Perth	9	Waterloo	13
Dundas	7	Halton	5	Middlesex	12	Peterborough	3	Welland	9
Durham	4	Hastings	4	Muskoka	5	Prescott	1	Wellington	18
Elgin	11	Huron	15	Nipissing	4	Prince Edward	2	Wentworth	6
Essex	7	Kent	13	Norfolk	4	Rainy River	3	York	21

The following Abstract 2 shows the progress of Public Libraries at intervals of five years since 1883 when only 93 libraries reported having 13,672 members, who borrowed 251,890 books ; we now have (for the year ending 30th April, 1899) 364 libraries reporting with 121,397 members and readers who borrowed 2,547,131 volumes.

In addition there are 42 libraries which did not report, or were incorporated after the first of May, 1899.

Free Libraries are rapidly increasing and are greatly appreciated. In 1883 only one Free Library had been established, but now the Superintendent's report shows that there are 120 Free Libraries, and that several others have been established since the 30th of April, 1899.

2. Abstract showing the Progress of Public Libraries from 1883 to 1899

Year.	Institutes reporting.	Number of members.	Number of evening classes.	Number of pupils.	Number of reading rooms.	Number of newspapers and periodicals.	Number of volumes in libraries.	Number of volumes issued.	Total receipts.	Total assets.
									$ c.	$ c.
1883.....	93	13,672	28	1,758	59	1,540	154,093	251,920	59,716 00	225,190 00
1888.....	167	32,016	41	1,102	104	3,041	311,348	744,466	103,843 68	403,573 75
1893.....	255	84,088	41	1,117	156	4,745	510,326	1,415,867	160,556 26	685,412 17
1898.....	347	111,208	2	79	200	5,834	789,082	2,358,140	188,783 21	870,167 54
1899.....	364	121,397	2	35	200	5,839	862,047	2,547,131	193,421 20	935,975 81

II.—ART SCHOOLS, ETC.

The following Abstract 3. shows the number of certificates and medals awarded to Art Schools, Ladies' Colleges, etc., for drawing, painting, etc., at intervals of five years since 1883 :

3.—Abstract Showing the Number of Certificates Awarded for Drawing, Painting, etc., to Art Schools, Ladies' Colleges, etc.

Year.	Number of Art Schools, etc.	Primary Art Course.		Advanced Course.		Mechanical Course.		Industrial Art Course.	Extra subjects.	Departmental medals, etc.			
		Proficiency certificates.	Full teachers' certificates.	Proficiency certificates.	Full teachers' certificates.	Proficiency certificates.	Full teachers' certificates.	Proficiency certificates.	Painting, modelling, wood-carving, etc.	Gold medals.	Silver medals.	Bronze medals.	Special certificates.
1883.....	1	124	.....	31	.....	1	.....	.....	.....	....	...	....	..
1888	57	2,979	133	151	9	50	2	24	108	1	1	4	1
1893.....	85	4,753	220	301	13	139	10	11	165	1	16	11	21
1898.....	55	3,166	149	540	18	42	.....	30	171	1	2	11	14
1899.....	62	3,993	160	499	22	75	... ..	42	154	1	3	10	14

Art School Exhibitions.—Two exhibitions of students' work were held during the year.

1. An exhibition of industrial designs, architectural plans and designs, machine drawings, lithography, modelling in clay, painting on china, pen and ink sketches, wood carving, drawing for photogravure, etc., was held for a week, commencing on the 6th of June, at the Board of Trade Buildings, when representatives of the Boards of Trade throughout the Dominion met together to discuss the importance of providing Technical Education for the people.

2. An exhibition of the general work in drawing, painting, modelling, etc., sent to the Department for competition for certificates and medals from Art Schools, Ladies Colleges, etc , was held for a fortnight in connection with the Women's Historical Exhibition at Victoria University, commencing on the 14th of June.

Ontario Society of Artists.—This Society receives an annual grant of $500.00 from the Legislature on condition that it holds an annual exhibition, and gives two pictures to

the value of $200.00 to the Museum of the Education Department. In addition the sum of $800.00 is annually expended by the Department in the purchase of pictures from members of the Society on condition that the Society annually loans sufficient new pictures to fill one of the new picture galleries in the Education Museum.

The following pictures selected from the exhibitions of the Ontario Society of Artists up to December 1899, are now the property of the Education Department, viz,—Atkinson, "Evening"; Bell-Smith, "Westminster Bridge," "Island Park"; Blatchly, "A Quiet Pool, "Spring on the Hill"; Challener, "Milk Maid"; Cutts, "Coast of Dorset"; Coleman, "Farm, St. Lawrence River"; Gagen, "When the Tide is Low," "Fine Weather"; Knowles, "Notre Dame," "Pool of London"; Manly, "Dartmoor," "Stour at Canterbury"; Martin, T. M., "Road through the Beeches"; Matthews, "Tops of Mount Stephen"; Reid, Mrs. "Roses"; Rolph, "Humber River"; Sherwood, "Gold Prospector" Spurr, "Surrey Heath"; Tully, "Jeanne."

III.—LITERARY AND SCIENTIFIC INSTITUTIONS.

The following Institutions receive Legislative Grants, 1. Hamilton Literary and Scientific Institution; 2. Kingston School of Mining; 3. Ontario, Historical Society; 4. Ottawa French Canadian Institute; 5. Ottawa Literary and Scientific Society; 6. Ottawa St. Patrick's Literary and Scientific Association; 7. Ottawa Field Naturalist Club; 8. Toronto Canadian Institute; 9. Toronto Astronomical and Physical Society.

All of these Institutions give popular lectures on literature or science; some of them publish their transactions and others have museums, all of which are greatly appreciated by the public and assist in developing a taste for Literature, Science and Art.

GENERAL REMARKS.

I. London Normal School.

The opening of a third Provincial Normal School will form an important event in the educational history of Ontario for 1900. The Toronto Normal School was opened on the 1st day of November, 1847, with an attendance of twenty students which increased during the session to sixty students. The jubilee of its opening was celebrated in 1897. The success of the institution had become so apparent, and the value of professional training for teachers so well recognized, that a demand was made for additional Normal Schools, and accordingly the Ottawa Normal School was formally opened on the 15th of September, 1875. For a number of years it has been found impossible to accommodate, in the two Normal Schools, the large number of candidates who have desired to obtain Second Class Provincial Certificates. Indeed, the applicants have become so numerous within the last three or four years, that very frequently four or five hundred have been refused admission. The selection of London for the new Normal School was warranted, in view of the size of the city, its good educational facilities, and its central location in an important section of the western part of the Province. Following the practice adopted in several other countries, the Public Schools of the city, by an arrangement with the Board of Education, will be utilized for Model School purposes. There are many arguments in favor of an arrangement such as has been made with the London School Board, but the strongest plea in its favor is the satisfactory way in which a plan of this kind has been carried out in connection with many Normal Schools in the Eastern and Western States, as well as in the State of New York. The selection of one of the most successful High School Principals as Principal of the new Normal School, and the appointment of one of the most efficient Public School Inspectors as Vice-Principal, will afford every guarantee that the purposes of the students in their important professional courses will be carefully kept in view. It may be safely assumed that no more important duty devolves upon the Education Department than the adoption of such provisions as will secure a class of well qualified teachers for our Public Schools.

It is to be hoped that the establishment of a third Normal School will be followed by the appointment of a larger number of Second Class teachers in our Public Schools than heretofore. It is unfortunate that Boards of Trustees do not yet fully realize the advantage of having in our schools teachers of high qualifications. Too often there is a disposition in some places to secure the so-called cheap teacher, regardless of the important interests involved. Teachers of character and ability cannot be expected to remain in the profession unless their services are better remunerated. Young men and young women of energy cannot be blamed should they withdraw from a profession in which they find high scholarship and valuable experience are not properly appreciated. It may be doubted if a higher standard is exacted in other countries for teachers' certificates. In Ontario the standard has been very much advanced from what it was a dozen years ago. With the abolition of the Primary examination, a student who desires to become a teacher will ordinarily attend a High School three years, and with a year's professional training subsequently exacted, it will be readily conceded that the expense involved in entering the profession is considerable. Many Public School teachers are to be commended for giving such attention to study as to enable them eventually to become Principals of large Public Schools or teachers in our High Schools and Collegiate Institutes. It is a fact, however, that generally the teacher in a High School has had to spend four years attending a University, and with another year's attention to professional work, the remuneration is far from being such as might be expected from the outlay incurred. As will be readily recognized from the Regulations, special value is attached to experience, without which neither scholarship nor professional training will secure the highest grades of certificates. It would be impossible, in a free country like Canada, to fix a minimum salary. Any attempt to legislate for this purpose would be to run counter to well recognized principles of economic laws. All that can be done by legislation is to lay down the highest feasible standard of qualification, and to hope that public opinion will, ere long, recognize that the best policy for trustees, as well as for the country, is to select from among the candidates presenting themselves for positions, those teachers who, by scholarship, experience and character will exercise the best influence upon the youth committed to their charge.

II. Courses of Study.

It is of the first importance that the training given in our High and Public Schools should be as practical as possible, and that the subjects taken up in the Public Schools and also in the lower Forms of the High Schools should have in view the pursuits that will necessarily be followed by the great majority of our citizens. The fact should not, however, be overlooked, that the value of the training given in our schools does not depend so much upon the knowledge gained as the habits which the pupils form. If, in all matters that pertain to character building, the work of the schools is of the proper kind, the subjects to be taken up are of secondary importance. If the influence of the teacher makes the pupil intelligent, industrious and law-abiding, the amount of Grammar, Arithmetic, Algebra, etc., acquired will not be a matter of prime importance. After all, only the beginning of an education can be gained at best in our schools, and if pupils go forth to the active duties of life with correct principles of conduct inculcated, it may be assumed they will become valuable members of society. More and more the leading educationists of the world are attaching greater value to training, and greater freedom is being noticed in connection with the adoption of programmes of study.

It is a fact, however, that only a small proportion of the pupils attending the Public Schools ever enter a High School, and that of those who attend our secondary schools only a fraction will ever be enrolled in our Universities. Under these circumstances, it must be admitted that the requirements of the masses of children must control in determining the courses of study to be taken up. No course of study for our Public Schools can be commended that overlooks the needs of the farming community. For many years Agriculture was an optional branch for the elementary schools. For the first time the subject is made compulsory for rural schools. Every pupil in the Fifth Form, and even in the Fourth Form of these Schools, is now required to give attention to Agriculture. Valuable results may be predicted if the subject is taken up carefully by our Public School teachers. It is well known that the study of Agriculture really embraces the study of

certain departments of elementary Science, and that the knowledge to be gained is not valuable to agriculturalists alone, but should be valuable to every young person in the Province. In this connection it is to be hoped that "Nature Study," as work of this kind is often called, will hereafter receive greater prominence in all our elementary schools. Some of our Public School Inspectors are giving special encouragement to studies of this kind, and the pupils in our rural schools are having their attention more frequently directed to the beauties of nature and the intellectual gain resulting from an examination of the elementary features of Botany, Geology, Zoology, Chemistry, etc.

The course of study for High Schools, judging from the opinions I receive from teachers and others, is now fairly satisfactory. Students who purpose attending a University have every reasonable inducement given them to take up, at an early stage, Latin and the other subjects that may be prescribed for matriculation. Again, the excellence of the present arrangement is quite significant. Pupils of the lower forms, who may not intend to become teachers or to enter the professions, will not be subject to any undue pressure in order to take up work which may not be the most valuable to them, should their probable destination in life be that of the mechanic, the merchant or the farmer. Doubtless many will seek guidance from the Principal of the school, but one main advantage of the present curriculum is that of having the interests of the great body of students paramount. It should always be felt that the course in life which pupils are to follow can never be safely predicted. Many ambitious students, or children of ambitious parents, may look forward to the advantages of University courses, but experience shows that many who begin with aims of this kind are, for various reasons, doomed to disappointment. It is safe to say that even among our High School pupils the great majority will follow the ordinary callings in life, and therefore it is wise to have a course of study laid down of such a character as will guard against numerous mistakes.

III. Continuation Classes.

By the amendment made in 1899 to the Public Schools Act, the course of study for Continuation Classes has been more clearly defined. It is well known that in many towns and villages of the Province, no High Schools have been established, and the formation of classes doing higher work than that of the Public School course has become a necessity. The studies to be taken up in Continuation Classes are substantially those of the lower forms of the High Schools. The object and aims of the pupils in those localities are identical with the purposes of students in towns and villages where High Schools have been established. A different course of study from that followed in the High School could not be thought of and the provisions by which work of this character may be taken up, with the concurrence of the trustees and the Public School Inspector, will satisfactorily meet existing conditions. The law now obliges the County Council to make a grant for Continuation Classes equivalent to that given by the Government. As a consequence, it may be expected that the efficiency, already recognized, of many Public Schools doing Continuation work in towns and villages will be more marked in the future.

It would be impossible, and indeed an injustice, to debar the trustees of rural schools from having work taken up beyond the High School Entrance examination. It is well known that many rural schools are attended by pupils whose attainments are beyond the Fourth Form, but who, on account of age or the circumstances of their parents, are unable to attend the nearest village High School. To do away with Fifth Form work in rural schools would not only be unjust, but even cruel. The Regulations regarding Continuation Classes have given an impetus to Fifth Form work in nearly all our rural schools. There is a desire on the part of pupils, teachers and trustees to have Fifth Book Classes. Doubtless it would be to the advantage of most pupils to attend a High School as soon as they can conveniently do so. For the reasons given this would, in many cases, be impossible, and upon the whole the existence of Fifth Form Classes in our rural schools will be in the interests of education, and will ultimately secure for the High Schools a larger number of deserving pupils. It would be the greatest folly to suppose that the country can have too many pupils attending our High Schools, or that too many young people are striving to obtain a good education. The idea of "over-education" is

too absurd to be seriously discussed. A greater number of educated farmers, mechanics, merchants, etc. is required by our Province. Failures in the community are not due to an excess, but to a lack of education. If the mechanic or the farmer becomes on the average more intelligent, a corresponding increase of dignity will be attached to the calling which he follows.

IV. Advantages of High Schools.

The popularity of our High Schools and Collegiate Institutes is well evinced by the liberal support given them by Municipal Councils. The impression that High School education is mainly for the benefit of the wealthy classes is held by very few of our citizens. The influence of secondary schools in promoting the excellence of elementary schools is seen in the increased ambition of pupils, who as a result not only stay longer in the Public Schools, but who do better work in consequence of the goal placed before them. The energies of Public School teachers are quickened on account of the demand made upon them by the High Schools. In this connection it might be well to quote the recent views of some prominent educationists :—

"One well recognized fact is this, that the High School exerts a powerful stimulus for good upon the schools below. It holds up before the young, ideals of higher and broader scholarship. It is the gateway to the otherwise inaccessible realms beyond ; it appeals to the ambition of the young ; it appeals to this ambition at a critical time, when it is important that inferior ambitions shall be forestalled ; it is a golden strand in that interest which holds the young up to a scholarly endeavor. It fits in with the thought that noble inspiration comes from above, not from below, that normal children respond better, not when they are pushed from beneath, but when they are drawn from on high. The longing for higher things thus aroused, children do better work in the lower schools ; they are more readily guided ; they hold to a definite course more steadily. Indeed, it is as true of the mind as of any ship that sails the seas, that it must have momentum to obey its helm. If this ambition to attend the High School, is in some measure, imitative,—a mere spirit to do as others do,—it is, in a larger measure, a spirit to study for study's sake, or for the rewards that study brings. It is not surprising, therefore, that school committees with scarcely an exception, should bear witness to the bracing influence of a good High School upon the grades below, experience thus confirming what theory would lead one to expect."—*Hon. Frank A. Hill, Secretary, Massachusetts Board of Education.*

"While it is true, as I have tried to show, that a system of education is like a pyramid, which, all the way down, should take its shape and its proportions from the corner stone at the apex, it must be admitted, nevertheless, that it is a piece of folly to try to stand a pyramid on its point. I have very great sympathy with those who emphasize the cause of the elementary schools. It is a shameful thing in a free community when the facilities for elementary education are not entirely adequate for the public needs. It is certainly true that the great masses of the children of the commonwealth leave school at the age of fourteen or earlier, and that these children must get their opportunities for education within that interval, or they will go into the world ignorant. It is also true that the system of education which is inadequate at the bottom, will reflect its insecurity all the way to the top. But this does not mean that at any higher point the pyramid is too large ; it means decisively and only that the foundation is too small. The remedy is not to be found by diminishing the contributions of the State for secondary and higher education ; it is distinctly to be found in enlarging the contributions for the lower."—*Hon. Seth Low, President, Columbia University.*

Free elementary schools have, since 1871, been guaranteed to Ontario. The question of free High Schools is left to be determined by the authorities of each municipality. Discussions have frequently arisen in many parts of the Province regarding the principle of free secondary education. The fees of county pupils attending High Schools cannot exceed $10 per annum. In many counties, commendable liberality has been shown in having county pupils admitted free or by the payment of a less amount than the minimum fee. The rule observed regarding resident pupils varies. In 51 High Schools and Collegiate Institutes, no fees are charged resident pupils. In the other

institutions, fees vary from $1 to $32 per annum. It would be a misfortune, I think, should the doors of our High Schools and Collegiate Institutes be closed to the children of parents in the humbler walks of life. The imposition of restrictions of this kind seems foreign to the genius of a democratic people. Occasionally the great Public Schools of England are referred to as the best models for Ontario to follow. It would be a mistake, I think, to suppose that the kind of institutions suitable to European conditions would answer for this continent. Our High Schools and Collegiate Institutes are not, I believe, behind any of the English institutions in the character of the training given by the teachers to whose management they are entrusted. The Province battled too strongly years ago, in favor of free education for our Public Schools, to overlook its good results. It would be a misfortune should our citizens restrict the benefits of education to those who have not reached the status of High School pupils. The resources of our country are great, but to develop these resources we must take care that children who have ability, but not wealth, shall be afforded every opportunity of contributing their share to the building up of our common nationality.

Our neighbors to the south of us have not overlooked the benefits to be derived from free High Schools. In nearly all the States of the American Union, the most Liberal provision has been made by which every boy and girl may have a High School training without the imposition of fees. Those States of the American Union which are most progressive have evidently favored free High Schools. In Massachusetts, pupils attending the High Schools are prepared for admission to any of the Universities, to the Normal Schools, or to the various professions, without any fees being imposed. So well does the State recognize the advantages of free High Schools that every city and town is compelled by law to provide free High School education. If a municipality does not make the necessary provision, children may attend some High School in another town or city, and the cost must be met by the municipality in which they reside. Would it not be well for our municipalities to consider if greater liberality in High School education would not be advantageous to the great body of ratepayers? Of course, the question of "over-education" may be raised. Is it not time, however, that objections of this kind should find no favor with intelligent people? There may be differences of opinion regarding the curriculum of our High Schools, but surely no one will contend that there is a surplus of intelligence, or that too many of our people have an excess of that intelligence which it is believed secondary schools promote. To confine the benefits of our High Schools to the children of parents who are in a position to pay high fees will necessarily restrict the number of well-trained mechanics, merchants, and farmers.

V. Manual Training.

Manual Training is now an optional subject of the High School and Public School courses of study, and much attention has been given in Canada within the last year to this modern department of educational work. The progress of science, in this latter part of the nineteenth century, has revolutionized all our industries, and it is safe to predict that in the approaching century many changes may be expected regarding the relative values of different branches of study. The curriculum of fifty years ago will not do to-day, and unless the Province realizes the important changes in the world's progress, it would be unreasonable to expect the laudable position, which our schools have held in the past, to be retained. In the United States, as well as in England and Germany, technical training has come to the front as an educational topic of discussion. In those countries, manual training has become a well recognized department of elementary and secondary education. It will not suffice to limit the benefits of technical education to those who are enrolled in universities or even in attendance at High Schools. A limitation of this character would be unreasonable, in view of the fact that such a very small percentage of persons ever attend the higher seats of learning. Technical education must, in its more elementary forms such as manual training, be taken up in the Public Schools, if we are to have well trained mechanics, farmers and merchants.

Education, to be effective, must not be one-sided. The intelligent use of the brain is no more needed than the intelligent exercise of the physical activities. Skilful hand-

work is really mind work in a high degree. The hand should be made to become the servant of the mind. Instruction in elementary science, free-hand and geometrical drawing, modelling in clay, etc., may be made to incite a love for that self-activity which it is the duty of the teacher to cultivate. Instruction in manual training will cultivate the perceptive faculties ; will create love for manual skill, dexterity, and taste for design ; it will induce young persons to observe for themselves, to acquire knowledge at first hand, and to make them more self-reliant. The fact should not be over-looked that by far the larger number of men in every civilized community are workers, and therefore a skilled hand becomes as important as a well-filled head. It is unfortunately true that in many departments of industry at the present day, there are too few skilled artisans to put into form the ideas of the designers. The unrest sometimes found among working classes arises from a lack of that skilful training which would enable them to make good use of their opportunities. To furnish that training which enables boys and girls to earn an honest living should be an important aim of every school. It is often said that the brightest boys come from the country. If the statement is analyzed, it will be found that the main advantage which the country boy has over the one from the city is that he has had the advantage of manual training, which is too often entirely denied to the one from the city.

The advance of applied science, with the resulting subdivision of labor so marked at the present day, has rendered instruction in technical education essential, in view of the changed economic conditions. Years ago the mechanic was usually proficient in the various departments of his work. His training enabled him to make a complete article, and he did not confine his attention to few processes. The work of the shoemaker, the blacksmith, the carpenter, etc., is very different from what it was half a century ago. The country must adapt itsef to the new requirements. This feature of the matter is put very clearly in a paper advocating certain reforms in the organization of technical education, by Professor Silvanus P. Thompson, who says :—

" Another most important reform is that of so utilizing the facilities for instruction as to develop breadth of view and capacity in those who are trained. This is all the more vital to the future of this branch of education because of the extreme and in many cases disastrous degree to which the subdivision of labor has been pushed in many of the handicraft trades. Formerly the apprentice learned a whole trade. He journeyed about to pick up the outlying branches and widen his experience before he could become a master. Nowadays the apprentice commonly learns under a master who practises but a part of a trade, and he himself is taught only one portion of that part. In the cabinet-making industry and in many of the metal industries, the result is deplorable. Men grow up capable of doing but one thing, and are dependent upon a wholly different set of men ; or upon several differents sets, to finish what they have begun or to begin the work that they receive from a subsequent stage in the process. The all-round competent hand grows rarer, and trade suffers and workmen suffer at every change of fashion. If judiciously directed, technical education may do much to alleviate this sad effect of the capitalistic tendencies of the past. It ought to be the incessant aim of the organizers of technical schools and classes to broaden the basis of the instruction and to fight against the narrowing tendencies abroad. But this must not be done without discrimination, otherwise it ends in absurdities."

In the same connection, the words of Sir Philip Magnus are very appropriate. He remarks :—

" The teaching of the theory of any particular trade will be more satisfactory and will be attended with less difficulty when the young apprentice leaves the elementary school with some knowledge of experimental method and some skill in applying it. The way might be much better prepared than it is for technical teaching. The School Board of London has been doing excellent work in its science demonstrations, which will facilitate technical teaching in the future. Other schools boards are, I believe, doing likewise. But the consideration of this subject would take me too far from the immediate subject of my paper. I want to show only as regards the theory that enters into trade teaching that for the purposes of technical instruction in trade subjects the principles of science must be taught in their special application to the trade, and must be illustrated by examples with which the young apprentice is familiar, and by experiments which he

would be likely to need in his ordinary work. You will see, therefore, that the teaching of the theory of any trade must be made to illustrate the practice, just as the teaching of the practice must be made to illustrate the theory. For such teaching a sufficient supply of apparatus and appliances is a first requisite, but the machinery and tools employed in a technical school are used with different objects and with a different intention from those of the factory or commercial workshop."

Another distinguished English writer also states :—

"The necessity for the general adoption of some system of technical education has become more and more evident as the ancient system ef apprenticeship has gradually died out. This ancient system of apprenticeship was one admirably adapted to the conditions of life, and to the requirements of the time. The apprentice lived with his master, learned the manual portion of his trade in the shop, and received from his master such instruction as he could or was disposed to give in the arts and mysteries (*i.e.*, science) of the particular industry. The instruction was oral, nothing was committed to paper, and the secrets of the trade were handed down from generation to generation. This system tended to limit the number of entrants into any one trade, and thereby to prevent the overcrowding of any particular labor market. On the other hand development was hampered by the system; the methods of one establishment did not become known to another; the apprentice had to assume a very humble and often menial position; his life was frequently very hard, the feeding often inadequate, and the flogging none too rare. Nevertheless, a highly skilled master had at all times many candidates for apprenticeship from whom he, as a matter of course, selected the most promising. Taking all the circumstances into consideration, it is scarcely to be wondered at that the system produced a greater proportion of first-class workmen than exists at the present time. One weak point consisted in the comparative narrowness of the education received, consequent upon the fact that the apprentice had no source of information other than his master or his master's shop."

It should not be thought that the advocacy of technical education is confined to those who have no acquaintance with the advantages of High School or University education. No better authority on this point can be found than Sir Joshua Fitch, whose judgment in pedagogical and other educational questions gives him a front rank. The distinguished ex-Inspector of English Schools puts the case as follows :—

"We have all agreed that our schools have been for centuries too much absorbed in book work, in verbal studies which sought to train memory and reasoning only, but which failed altogether to give adequate discipline for the eye and the hand, or to fit the scholar for skilled labor and for practical life Parliament and public opinion have concurred in desiring to correct and supply this grave defect; and the technical instruction act and the local taxation (customs and excise) act are the national expression of a determination to do so. And these measures have already, as we all know, borne abundant fruit. No one can read, for example, the admirable and comprehensive report just presented to the London County Council by its technical education board without seeing how completely the higher trades and the whole work of the skilled artisan in London will be transformed ere long by the well-devised efforts of that board to give a more scientific character to the instruction of apprentices and workmen, so as to improve the quality of the work done by them."

The same distinguished educationist shows the futility of having technical education taken up by pupils who have not received the fundamentals of a good elementary education. His words are as follows :—

"You will anticipate the inference, which from my own point of view, as an old inspector of schools and training colleges, I am inclined to deduce from these considerations. I entirely admit that our school instruction has long been too bookish, too little practical, and that the friends of technical instruction are fully justified in calling attention to the grave deficiences in our system, especially to the want of sounder teaching in physical science, and of better training in the application of those sciences, to the enrichment of the community, and to the practical business of life. And we are all agreed, too, in the belief that apart from the industrial and economic results of better manual instruction, there may be in such instruction a high educational purpose, that it may tell on character, awaken dormant faculty, teach the better use of the senses, and

increase the power of the human instrument over matter and over the difficulties of life. Only do not let us exaggerate the educational value of manual instruction, or suppose that all our difficulties are to be solved by turning our schools into workshops. Without co-ordinate intellectual training and development, manual training will only accomplish a part, and not the highest part of the work which lies before the teachers of the future. Let us recognize its necessary limitations. And we can do this in at least two ways :—First, by aiming at a higher standard of general intellectual culture in the schools from which technical schools are recruited, and thus securing a more solid groundwork for our special instruction. And the second expedient is to urge, whenever possible, upon each of the young people in our trade and evening classes, to take up one subject at least—it may be history or mathematics, or philosophy, or a foreign language—which has no direct or visible relation to his trade or to the means whereby he hopes to get a living, but is simply chosen because he likes it, because his own character is enriched and strengthened by it, because it helps to give him a wider outlook upon the world of nature, of books and of men, and because he thus may prepare himself better for the duties of a citizen and a parent, as well as for an honored place in the ranks of industry."

VI. Empire Day.

Canada is fast making history for itself. Already the youth of our country realize the grandeur of their relations as citizens of the British Empire. On the 23rd of May last, the day before the commemoration of Her Majesty's birthday, the schools of this Province, as well as of the other Provinces of the Dominion, celebrated what will hereafter mark a step in the advancement of that unity of the Empire, to which so much attention has been given of late years. It may be expected that the celebration of Empire Day will in future be characterized by the same objects as marked the event in 1899. The day is not a holiday in the ordinary sense of the term, but it may be presumed that hereafter its annual recurrence will be devoted to exercises of a patriotic character, like those of last year. Inspectors in all parts of the Province, as well as Principals of schools, deserve no small credit for the excellent manner in which the event was inaugurated. In most of the schools, part of the forenoon was taken up by the teachers with references to the history of the British Empire, and the admirable heritage which we, as subjects of Her Majesty, enjoy. In the afternoon, trustees, members of Municipal Councils, members of Parliament, clergymen and other prominent citizens, gave addresses to the children assembled in the schools or in halls, to which the public was generally invited. It must be evident that exercises of this character cannot fail to impress the children attending our schools with the great blessings possessed by those who have reaped the advantage of centuries of progress towards the highest type of constitutional government.

It is satisfactory to know that in no instance does there appear to have been any disposition to cultivate what is termed the "jingo spirit" among the pupils attending our Public Schools. In the addresses given in many places attention was directed to those ideals of liberty which have guided our statesmen, to the advance of education, the growth of tolerance, the progress of self government, and the improvement in the moral atmosphere among Anglo-Saxon communities. Attention was doubtless called, and properly so, to the magnificent resources of our country, to the literature and art left us by our British ancestry, and to the distinguished men and women who have given their talents, their means, and even their lives, for the promotion of Christian civilization. The opportunity appears to have been well employed for filling the minds of the pupils with the highest kind of patriotism—a patriotism inspired by a higher conception of civic duty, improved devotion to the public interests, willingness to offer personal service in behalf of one another, and a disposition to give assistance for the promotion of social improvement.

The events which have lately been transpiring in another part of the Empire have brought to the attention of all our citizens the common interest felt by all who live under the British flag. There need be little fear, I think, of any tendency on the part of the people of this Province to become fond of war or anxious to depart from those principles

of government which have had influence for so many years in the preservation of peace. Indeed, the celebration of Empire Day may, if observed in the future as it was in 1899, do much to teach the children of our Public Schools that however glorious has been the history of the British Empire in the past, its greatest glory is due to the desire of its statesmen to extend the principles of good government to every country brought under the dominance of British authority The pupils of our Public Schools have been taught to know that wherever the British flag floats, order is established, equal rights prevail, education is fostered, liberty is upheld, and general progress ensues. They have been told that the trade, commerce, and industry, for which Britain is noted, combine in making the preservation of peace one of the chief objects of the Empire. If the attention of young Canadians should always be directed to such characteristics of the British nation we may reasonably hope the chances of preserving peace will be increased and the inculcation of true patriotism will be a controlling feature of school work.

VII. Conclusion.

The foregoing summary, which is compiled from statistical returns filed in the office of the Education Department for 1898, deals with matters which pertain to the work of my predecessor, Hon. G. W. Ross, now Premier of the Province, whose connection with the administration of our school system extended from 1883 to 1899, a period of about sixteen years. This period has been one of great progress in school matters, and it is evident that many of the questions, which were constant topics of discussion eight or ten years ago, have been settled. At the same time, it is to be expected that the future will present important educational problems to be solved by those who take an interest in the progress and welfare of our country. For the present, at least, there seems to be no demand for radical changes, either in the courses of study for our High and Public Schools, or for amendments to the Statutes. The course of study for 1900, 1901 and 1902 having been settled, there will be ample opportunity for considering in the interim any proposed changes which it may be thought desirable to bring into effect thereafter.

I have the honor to be

Your Honor's obedient servant,

RICHARD HARCOURT,

Minister of Education.

APPENDICES.

APPENDIX A.

STATISTICAL TABLES.

I.—TABLE A —The

Counties. (Including incorporated villages, but not cities or towns.)	School population.—Pupils						
	School population between 5 and 21 years of age.	Pupils under 5 years of age.	Pupils between 5 and 21 years of age.	Pupils over 21 years of age.	Total number of pupils of all ages attending school.	Boys.	Girls.
1. Brant	4,165	9	3,356	.....	3,365	1,795	1,570
2. Bruce	15,137	32	12,262	11	12,305	6,544	5,761
3. Carleton	8,780	20	6,913	9	6,942	3,651	3,291
4. Dundas	5,616	41	4,821	3	4,865	2,490	2,375
5. Dufferin	5,387	25	5,076	10	5,111	2,762	2,349
6. Durham	5,606	21	5,179	3	5,203	2,716	2,487
7. Elgin	8,250	22	6,749	2	6,773	3,544	3,229
8. Essex	11,705	29	8,685	3	8,717	4,513	4,204
9. Frontenac	6,929	51	6,017	2	6,070	3,194	2,876
10. Glengarry	4,823	28	4,216	3	4,247	2,203	2,044
11. Grey	16,455	76	14,091	11	14,178	7,482	6,696
12. Haldimand	5,967	20	4,752	2	4,774	2,472	2,302
13 Haliburton & N. E. Muskoka	4,493	52	3,840	8	3,900	2,130	1,770
14. Halton	5,166	.....	3,808	.....	3,808	1,956	1,852
15. Hastings	12,661	32	9,285	4	9,321	4,837	4,484
16. Huron	15,314	51	11,884	10	11,945	6,290	5,655
17. Kent	10,694	28	9,053	3	9,084	4,807	4,277
18. Lambton	12,628	27	10,097	6	10,130	5,233	4,897
19 Lanark	6,347	13	4,804	.....	4,817	2,482	2,335
20 Leeds and Grenville	11,319	55	9,874	8	9,937	5,126	4,811
21. Lennox and Addington	5,718	13	4,910	2	4,925	2,580	2,345
22. Lincoln	5,244	15	4,112	2	4,129	2,136	1,993
23. Middlesex	12,757	30	10,327	3	10,360	5,441	4,919
24. Norfolk	8,818	29	6,494	.....	6,523	3,419	3,104
25. Northumberland	8,115	15	6,559	.....	6,574	3,472	3,102
26. Ontario	8,617	11	7,326	6	7,843	4,236	3,607
27. Oxford	10,283	12	7,595	1	7,608	3,973	3,635
28. Peel	6,307	16	4,433	6	4,455	2,388	2,067
29. Perth	10,702	18	7,060	.....	7,078	3,832	3,246
30. Peterborough	7,505	28	5,537	.....	5,565	2,892	2,673
31. Prescott and Russell	8,720	31	5,775	7	5,813	3,020	2,793
32. Prince Edward	3,411	32	3,133	5	3,170	1,624	1,546
33 Renfrew	11,213	68	7,994	11	8,073	4,062	4,011
34. Simcoe and W. Muskoka	17,716	46	15,888	7	15,941	8,488	7,453
35. Stormont	5,454	21	4,298	3	4,322	2,254	2,068
36. Victoria & S. E. Muskoka	8,253	20	7,145	5	7,170	3,871	3,299
37. Waterloo	9,544	5	7,184	.....	7,189	3,887	3,302
38. Welland	6,548	34	5,478	.....	5,512	2,843	2,669
39. Wellington	13,376	36	8,911	5	8,952	4,823	4,129
40 Wentworth	7,147	.....	5,314	2	5,316	2,779	2,537
41. York	14,956	45	12,012	3	12,060	6,497	5,563
42. District of Algoma	7,212	48	6,247	11	6,306	3,233	3,073
43. District of Nipi-sing	1,882	26	1,749	1	1,776	922	854
44. District of Parry Sound	5,687	43	5,103	4	5,150	2,619	2,531
Total	382,628	1,274	305,846	182	307,302	161,518	145,784
Cities.							
1. Belleville	2,634	.....	1,596	.....	1,596	793	803
2 Brantford	2,988	.....	2,665	.....	2,666	1,360	1,306
3. Chatham	2,694	.....	1,632	.....	1,632	828	804
4. Guelph	3,495	.....	1,803	1	1,804	906	898
5. Hamilton	13,554	.....	8,951	1	8,952	4,545	4,407
6. Kingston	5,710	.....	2,677	.....	2,677	1,320	1,357
7. London	10,055	.....	6,160	.....	6,160	3,190	2,970
8. Ottawa	15,918	.....	5,088	.....	5,088	2,705	2,383
9. St. Catharines	2,814	.....	1,604	.....	1,604	823	781
10 St Thomas	4,610	.....	2,123	.....	2,123	1,053	1,070
11. Stratford	3,060	.....	1,578	.....	1,578	818	760
12. Toronto	50,918	2	29,768	1	29,771	15,097	14,674
13. Windsor	3,435	.....	2,306	.....	2,306	1,173	1,133
Total	121,915	2	67,952	3	67,957	34,611	33,346

* In report of 1898 the percentage of average attendance was given as 41 ; it should have been

Public Schools

attending the Public Schools.

	Attending less than 20 days during the year.	20 to 50 days.	51 to 100 days.	101 to 150 days.	151 to 200 days.	201 days to the whole year.	No. of children 8 to 14 (inc.) who did not attend any school during the year.	No. of children 8 to 14 (inc.) who did not attend any school for 100 days during the year.	Average attendance of pupils.	Percentage of average to total attendance
1	201	453	710	814	1,038	149	3	638	1,838	56
2	936	1,699	2,376	2,739	4,089	466	94	1,927	6,656	54
3	743	1,160	1,599	1,526	1,746	168	19	1,633	3,279	47
4	474	645	900	1,167	1,616	63	20	784	2,554	53
5	589	835	1,256	1,213	1,089	129	8	1,217	2,218	44
6	404	762	1,056	1,294	1,504	183	89	860	2,746	53
7	524	824	1,321	1,560	2,262	282	72	1,133	3,801	56
8	812	1,326	2,128	2,030	2,263	158	300	2,132	4,246	49
9	878	1,204	1,440	1,261	1,125	162	50	1,370	2,514	42
10	494	679	959	1,087	1,004	24	49	1,220	1,978	46
11	1,398	2,220	3,139	3,260	3,651	510	85	3,094	6,434	45
12	253	521	903	1,100	1,700	297	5	639	2,954	62
13	619	797	996	794	624	70	75	1,030	1,547	40
14	230	459	747	886	1,356	130	1	501	2,094	55
15	965	1,356	1,948	2,154	2,578	320	67	1,947	4,779	51
16	717	1,411	2,069	3,043	4,133	572	35	1,510	6,854	58
17	958	1,414	2 059	2,156	2 157	340	24	2,095	4,223	47
18	787	1,306	1,821	2,509	3,486	221	28	1,378	5 528	55
19	359	679	949	1,198	1,479	153	55	1,007	2,618	55
20	1,099	1,548	2,056	2,320	2,638	276	86	1,817	4,822	49
21	616	780	987	1,077	1,312	153	55	1,266	2,365	48
22	358	546	860	985	1,282	98	19	792	2,170	53
23	656	1,198	2,160	2,567	3,493	286	49	1,428	5,812	56
24	584	952	1,459	1,529	1,756	243	27	1,146	3,278	50
25	497	877	1,316	1,547	2,117	220	120	1,107	3,476	53
26	518	1,096	1,690	1,765	2,450	324	32	1,249	4,154	53
27	453	960	1,481	1,839	2 468	407	15	1,105	4,421	58
28	392	634	957	1,115	1,298	59	24	921	2,228	50
29	412	807	1,488	1,838	2,254	279	27	1,208	3,833	54
30	523	771	1,254	1,441	1,465	111	77	1,206	2,805	51
31	564	957	1,395	1,441	1,348	108	113	1,624	2.753	48
32	257	463	595	751	891	213	9	456	1,705	54
33	1,028	1,460	1,955	1,744	1,659	227	.....	2,003	3,555	44
34	1,223	2,402	3,613	3,808	4,078	817	80	2,450	7,940	50
35	517	669	986	1,042	1,002	196	15	877	2,038	47
36	767	1,126	1,724	1,681	1,726	146	20	1,733	3,506	49
37	307	601	1,197	1,538	2,919	627	23	970	4,530	63
38	474	713	1,217	1,277	1,645	186	5	936	2,906	53
39	625	1,139	1,835	2,226	2,843	284	50	1,412	4,911	55
40	379	646	1,179	1,345	1,607	169	12	810	2,773	52
41	836	1,608	2,502	2,790	3,889	435	40	1,944	6,527	54
42	815	1,215	1,616	1,311	1,168	181	192	1,520	2,831	45
43	277	435	477	298	277	12	24	513	595	34
44	673	1,000	1,314	1,056	938	169	35	1,267	2,400	47
	27,191	44,353	65,689	72,122	87,423	10,524	2,238	57,875	157,195	52
1	67	155	295	344	725	10	.....	33	939	59
2	107	216	496	546	1,301	.....	.....	372	1,881	71
3	81	132	263	325	831	.....	.. ....	262	1,112	68
4	23	96	279	330	1,076	.....	....	....	1,297	72
5	168	501	1,297	1,431	5.555	.....	..... .	687	6,653	74
6	67	146	355	473	1,636	.....	....	.....	2,082	78
7	191	384	862	1,248	3,475	.....	.....	743	4,289	70
8	183	397	1,002	1,054	2,452	.. ..	....	699	3,392	67
9	58	159	303	311	773	....	.....	91	1,024	64
10	41	121	262	403	1,296	.....	42	37	1,512	72
11	44	85	225	351	873	.....	....	131	1,088	69
12	884	1,855	4,270	4,817	17,945	....	.....	... .	23,327	79
13	84	206	372	345	1,299	... ...	.....	246	1,684	74
	1,998	4,453	10,281	11,978	39,237	10	42	3,301	50,280	74

61. One county only (Waterloo) excels Haldimand in percentage of average attendance.

I.—TABLE A.—The

Towns.	School population.—Pupils						
	School population between 5 and 21 years of age.	Pupils under 5 years of age.	Pupils between 5 and 21 years of age.	Pupils over 21 years of age.	Total number of pupils of all ages attending school.	Boys.	Girls.
1. Alliston	344		344		344	180	164
2. Almonte	977		394		394	192	202
3. Amherstburg	650		290		290	157	133
4. Arnprior	863		570		570	290	280
5. Aurora	461		333		333	168	165
6. Aylmer	537		465		465	220	245
7. Barrie	1,631		1,280		1,280	657	623
8. Berlin	2,849		1,375		1,375	736	639
9. Blenheim	496		427		427	224	203
10. Bothwell	241		216		216	115	101
11. Bowmanville	587		561		561	284	277
12. Bracebridge	845		747		747	377	370
13. Brampton	572		572		572	309	263
14. Brockville	2,721	2	1,381		1,383	689	694
15. Carleton Place	1,317		853		853	424	429
16. Clinton	673		518		518	280	238
17. Cobourg	1,099		623		623	329	294
18. Collingwood	1,848		1,265		1,265	639	626
19. Cornwall	1,018		656		656	323	333
20. Deseronto	822		680		680	343	337
21. Dresden	515		445		445	214	231
22. Dundas	857	10	541		551	295	256
23. Durham	420		407	2	409	201	208
24. Essex	440		372		372	189	183
25. Forest	456		341		341	176	165
26. Fort William	897	2	705		707	359	348
27. Galt	1,698		1,439		1,439	727	712
28. Gananoque	1,098		778		778	415	363
29. Goderich	1,044		740		740	377	363
30. Gore Bay	733		521	8	529	247	282
31. Gravenhurst	762		762		762	385	377
32. Harriston	499	1	422		423	219	204
33. Ingersoll	1,394		773		773	388	385
34. Kincardine	500		499		499	245	254
35. Leamington	535		529		529	250	279
36. Lindsay	1,170		1,068		1,068	545	523
37. Listowel	851		620		620	335	285
38. Little Current	313		201		201	109	92
39. Mattawa	700		123		123	58	65
40. Meaford	435		424	1	425	220	205
41. Midland	800		652		652	333	319
42. Milton	370		370		370	172	198
43. Mitchell	671		474		474	244	230
44. Mount Forest	528		515		515	288	227
45. Napanee	698		655		655	333	322
46. Newmarket	660		395		395	196	199
47. Niagara	340		298		298	161	137
48. Niagara Falls	840		633		633	334	299
49. North Bay	696		453		453	221	232
50. North Toronto	600		450		450	220	230
51. Oakville	424		319		319	154	165
52. Orangeville	593		551		551	254	297
53. Orillia	1,721		1,086		1,086	528	558
54. Oshawa	1,194		795		795	370	425
55. Owen Sound	1,888		1,437		1,437	714	723
56. Palmerston	545		504		504	248	256
57. Parkhill	450		258		258	135	123
58. Paris	932		602		602	316	286
59. Parry Sound	746		713	4	717	358	359

Public Schools.

attending the Public Schools.

	Attending less than 20 days during the year.	20 to 50 days.	51 to 100 days.	101 to 150 days.	151 to 200 days.	201 days to the whole year.	No. of children 8 to 14 (inc.) who did not attend any school during the year.	No. of children 8 to 14 (inc.) who did not attend any school for 100 days during the year.	Average attendance of pupils.	Percentage of average to total attendance.
1	10	24	54	66	190	.....	.....	57	231	67
2	26	28	48	78	214	.....	.....	.....	275	70
3	20	37	53	52	128	.....	3	44	163	56
4	18	53	100	112	287	.....	.....	92	371	65
5	14	22	35	77	183	2	.....	28	230	69
6	17	35	69	115	229	.....	.....	29	309	66
7	74	135	225	276	570	.....	.....	.....	786	61
8	17	57	117	224	960	.....	.....	150	1,059	77
9	23	30	73	115	186	.....	.....	64	268	63
10	10	29	47	44	86	.....	.....	20	132	62
11	17	31	63	150	300	.....	.....	34	392	70
12	66	81	254	203	143	.....	.....	116	346	46
13	24	44	87	111	306	.....	.....	14	354	62
14	31	87	212	303	750	.....	.....	158	978	71
15	21	55	153	217	407	.....	.....	68	553	65
16	16	31	71	116	280	4	.....	20	365	71
17	18	39	117	174	275	.....	.....	30	419	68
18	64	121	259	310	511	.....	.....	270	791	63
19	23	44	103	137	349	.....	.....	77	450	69
20	35	50	100	133	357	5	.....	70	462	69
21	19	44	78	82	214	8	10	71	293	66
22	21	29	68	91	342	.....	.....	28	400	73
23	8	37	56	116	192	.....	.....	32	265	65
24	16	43	64	84	165	.....	.....	70	226	61
25	12	20	54	78	177	.....	.....	37	233	68
26	50	54	127	149	319	8	.....	99	455	65
27	33	73	171	241	892	29	.....	77	1,085	76
28	49	67	124	156	382	.....	.....	66	502	65
29	28	52	95	154	411	.....	.....	.....	517	70
30	32	62	171	105	159	.....	3	11	273	52
31	66	104	259	167	166	.....	40	.....	390	51
32	25	35	56	77	230	.....	.....	.....	278	66
33	35	71	130	170	367	.....	.....	105	493	64
34	20	36	107	142	194	.....	.....	59	299	60
35	23	47	94	142	223	.....	.....	82	321	61
36	24	72	133	202	626	11	.....	88	758	71
37	19	46	88	112	355	.....	.....	80	429	69
38	15	32	57	50	47	.....	.....	.....	95	48
39	9	8	37	32	37	.....	.....	7	74	60
40	24	36	64	84	217	.....	.....	55	278	66
41	24	71	129	122	306	.....	.....	162	419	64
42	15	19	40	62	234	.....	.....	33	270	74
43	11	27	51	99	282	4	.....	16	350	74
44	15	42	71	108	279	.....	.....	72	358	70
45	32	59	104	135	325	.....	.....	55	451	69
46	17	24	57	67	230	.....	.....	19	271	69
47	22	36	92	67	81	.....	.....	42	153	52
48	10	36	137	120	330	.....	.....	36	454	72
49	36	42	103	106	166	.....	.....	46	271	60
50	16	52	84	114	184	.....	.....	64	285	63
51	6	26	50	78	159	.....	4	27	208	66
52	30	40	76	109	296	.....	.....	72	365	66
53	41	76	174	202	593	.....	.....	67	752	69
54	21	62	121	159	432	.....	.....	88	533	67
55	57	109	228	298	745	.....	.....	108	990	69
56	28	37	85	101	253	.....	.....	77	329	66
57	3	20	38	72	125	.....	.....	.....	185	72
58	12	30	96	118	311	35	.....	.....	432	72
59	72	109	135	172	228	1	.....	86	350	49

I.—TABLE A —The

Towns.	School population. — Pupils						
	School population between 5 and 21 years of age.	Pupils under 5 years of age.	Pupils between 5 and 21 years of age.	Pupils over 21 years of age.	Total number of pupils of all ages attending school.	Boys.	Girls.
60. Pembroke	1,156		642		642	341	301
61. Penetanguishene	617		282		282	163	119
62. Perth	986		571		571	285	286
63. Peterborough	4,064		1,720		1,720	876	844
64. Petrolea	1,478		1,074		1,074	539	535
65. Picton	868		645		645	348	297
66. Port Arthur	927		466		466	234	232
67. Port Hope	1,123		890		890	437	453
68. Prescott	701		373		373	174	199
69. Rat Portage	1,031		870		870	468	402
70. Renfrew	807		463		463	216	247
71. Ridgetown	665		546		546	279	267
72. Sandwich	429		291		291	137	154
73. Sarnia	2,133		1,317		1,317	676	641
74 Sault Ste. Marie	988		814		814	412	402
75. Seaforth	717		468		468	239	229
76. Simcoe	751		521		521	284	237
77. Smith's Falls	1,050		967		967	490	477
78. Stayner	374		355		355	180	175
79. Sturgeon Falls	145	3	102		105	67	38
80. St. Mary's	937	1	785		786	382	404
81. Strathroy	754		573	1	574	283	291
82. Sudbury	210		204		204	104	100
83. Thessalon	262		261		261	130	131
84. Thornbury	355		220		220	122	98
85. Thorold	511		385		385	195	190
86. Tilsonburg	516		444		444	211	233
87. Toronto Junction	1,707		1,701		1,701	891	810
88. Trenton	1,300		658		658	332	326
89. Uxbridge	724		446		446	219	227
90. Vankleekhill	483	2	182		184	99	85
91. Walkerton	697		534		534	262	272
92. Walkerville	386		241		241	130	111
93. Wallaceburg	904		647	2	649	330	319
94. Waterloo	986		625		625	309	316
95. Welland	442		402		402	204	198
96. Whitby	802		476		476	259	217
97. Wiarton	650		570		570	318	252
98. Wingham	671		544		544	273	271
99. Woodstock	1,946		1,734		1,734	865	869
Total	86,757	21	61,429	18	61,468	31,232	30,236
Totals.							
1. Counties, etc	382,628	1,274	305,846	182	307,302	161,518	145,784
2. Cities	121,915	2	67,952	3	67,957	34,611	33,346
3. Towns	86,757	21	61,429	18	61,468	31,232	30,236
4. Grand total, 1898	591,300	1,297	435,227	203	436,727	227,361	209,366
5. Grand total, 1897	590,055	1,269	439,642	246	441,157	230,335	210,822
6. Increase	1,245	28					
7. Decrease			4,415	43	4,430	2,974	1,456
8. Percentage		.30	99.65	.5		52	48

Public Schools.

attending the Public Schools.

	Attending less than 20 days during the year.	20 to 50 days.	51 to 100 days.	101 to 150 days.	151 to 200 days.	201 days to the whole year.	No. of children 8 to 14 (inc.) who did not attend any school during the year.	No. of children 8 to 14 (inc.) who did not attend any school for 100 days during the year.	Average attendance of pupils.	Percentage of average to total attendance.
60	25	38	101	122	356	.....	.....	.....	450	70
61	15	41	72	77	77	.....	.....	10	157	56
62	18	28	67	111	347	.....	.....	36	409	72
63	35	85	249	309	1,042	.....	.....	135	1,278	74
64	45	73	139	225	592	.....	.....	85	762	71
65	28	60	84	122	351	.....	.....	69	436	68
66	17	48	76	97	228	.....	.....	43	309	66
67	25	43	125	184	513	.....	.....	72	648	73
68	11	26	55	99	182	.....	27	.....	254	68
69	54	118	189	136	373	.....	.....	92	511	59
70	12	30	63	131	227	.....	.....	47	325	70
71	31	38	79	116	282	.....	.....	83	360	66
72	16	41	75	60	99	.....	21	23	161	56
73	51	92	221	273	680	.....	.....	82	868	74
74	75	113	163	205	258	.....	.....	207	445	55
75	10	41	73	108	236	.....	.....	52	312	67
76	37	48	94	109	233	.....	4	92	315	61
77	36	67	167	178	519	.....	.....	122	664	69
78	8	49	58	98	142	.....	.....	81	165	47
79	16	17	16	35	21	.....	.....	5	46	44
80	35	63	258	299	131	.....	.....	53	391	50
81	20	46	101	120	287	.....	.....	17	376	66
82	14	17	45	54	74	.....	.....	27	124	61
83	21	36	63	65	76	.....	.....	60	137	53
84	17	22	49	45	87	.....	3	46	136	62
85	18	38	72	125	132	.....	.....	18	210	55
86	24	39	67	92	222	.....	.....	88	286	65
87	138	174	382	355	652	.....	.....	291	938	55
88	42	49	118	145	304	.....	.....	195	418	64
89	25	43	72	115	191	.....	.....	60	267	60
90	5	18	22	37	102	.....	.....	9	142	78
91	7	34	59	80	349	5	.....	29	400	75
92	5	18	39	36	143	.....	.....	28	174	73
93	38	51	126	136	298	.....	170	81	411	64
94	8	27	59	122	409	.....	.....	21	478	77
95	18	31	64	70	219	.....	.....	67	271	68
96	27	32	101	110	206	.....	.....	.....	301	63
97	28	57	95	129	261	.....	.....	25	331	58
98	26	50	94	77	284	13	.....	40	359	66
99	54	113	213	349	979	36	.....	25	1,256	73
	2,675	4,972	10,409	13,112	30,149	151	285	5,894	40,305	66
1	27,191	44,353	65,689	72,122	87,423	10,524	2,238	57,875	157,195	52
2	1,998	4,453	10,281	11,978	39,237	10	42	3,301	50,280	74
3	2,675	4,972	10,409	13,112	30,149	151	285	5,894	40,305	66
4	31,864	53,778	86 379	97,212	156,809	10,685	2,565	67,070	247,780	57
5	32,446	54,725	90,147	97,824	157,835	8,180	2,243	68,791	248,548	56
6	.....	.....	.....	.....	.....	2,505	322	.....	.....	1
7	582	947	3,768	612	1,026	.....	.....	1,721	768	.....
8	7	12	20	22	37	2	.....	.....	.....	.....

II.—TABLE B —The

Number of pupils in the

Counties. (Including incorporated villages but not cities or towns.)	Reading.						Writing.	Arithmetic.	Drawing.
	1st Reader Part I.	1st Reader Part II.	2nd Reader.	3rd Reader.	4th Reader.	5th Reader.			
1. Brant	578	403	726	809	631	218	3,365	3,365	3,365
2. Bruce	2,679	1,923	2,115	2,609	2,370	609	12,115	12,180	11,974
3. Carleton	1,577	958	1,391	1,352	1,335	329	6,158	6,742	6,689
4. Dundas	1,241	847	931	773	804	269	4,754	4,849	4,589
5. Dufferin	1,169	723	832	975	1,098	314	4,947	4,997	4,910
6. Durham	937	772	1,107	1,138	969	280	5,203	5,203	5,203
7. Elgin	1,375	936	1,288	1,250	1,334	590	6,543	6,607	6,405
8. Essex	2,494	1,633	1,713	1,499	1,188	190	8,474	8,441	8,310
9. Frontenac	1,465	893	1,012	1,222	1,281	197	5,616	5,701	5,336
10. Glengarry	1,272	608	958	676	625	108	4,185	4 202	3,822
11. Grey	3,268	2,260	3,006	3,049	2,077	528	14,052	13,928	12,576
12. Haldimand	978	698	909	938	1,041	210	4,673	4,712	4,330
13. Hal'b'rt'n & N. E. Mus	1,059	726	823	753	470	69	3,678	3,733	3,329
14. Halton	753	618	658	703	826	250	3,808	3,808	3,808
15. Hastings	2,535	1,838	1,739	1,634	1,289	286	9,170	9,253	9,046
16. Huron	1,910	1 559	2,198	2,669	2,656	953	11,522	11 718	11,028
17. Kent	2,332	1,317	1,806	1,528	1,506	595	8,760	8.933	8,721
18. Lambton	2,453	1,766	1,694	1,872	1,785	560	10,018	10,0 0	9,804
19. Lanark	1,188	818	919	906	799	187	4,817	4,817	4,817
20. Leeds & Grenville	2,047	1,406	1,871	1,978	2,237	398	9,374	9,492	8,808
21. Lennox & Addington	1,052	612	861	1,125	1,074	201	2,906	2,919	2,882
22. Lincoln	855	571	691	903	1,016	93	3,955	4 032	3,812
23. Middlesex	1,801	1,469	1,861	2,156	2,434	639	10,221	10,290	10 242
24. Norfolk	1,412	876	1,209	1,209	1,546	271	6,366	6,454	6.074
25. Northumberland	1,257	861	1,360	1,521	1,296	279	6,471	6 521	6,407
26. Ontario	1,450	1,079	1,328	1,733	1,842	411	7,478	7,453	6,985
27. Oxford	1,470	1,109	1,311	1,564	1,591	563	7,466	7,487	7,181
28. Peel	909	678	768	964	879	257	4,388	4,423	4,275
29. Perth	1,288	1,019	1.084	1,872	1,356	509	6.797	6 905	5,836
30. Peterborough	1,343	844	1,000	1,167	1,052	159	5,216	5,452	4,767
31. Prescott & Russell	1,936	976	1,054	935	716	196	5,378	5,550	5,257
32. Prince Edward	526	373	567	612	836	256	3,142	3,131	3,035
33. Renfrew	2,177	1,277	1,569	1,403	1,368	339	7,373	7,796	6,310
34. Simcoe & W. Mus.	3,650	2,537	2,969	3,099	2,697	989	15,255	15 706	14,890
35. Stormont	1,119	628	991	745	675	134	4,305	4,320	4,218
36. Victoria & S. E. Mus.	1,449	1,092	1,398	1,559	1,291	381	6,810	6,971	6,589
37. Waterloo	1,489	1,185	1,702	1.606	971	236	6,793	7,036	6,632
38. Welland	1,210	717	939	1,097	1,247	302	5,409	5,491	5,401
39. Wellington	1,766	1,277	1,788	1,789	1,898	434	8,798	8,870	8 836
40. Wentworth	1,027	692	991	1,218	1,070	317	5,193	5,229	5,132
41. York	2,786	1,860	2,398	2,412	2,162	442	11,695	11,802	11,610
42. Dist. Algoma	1,813	1,017	1,150	1,313	862	151	5,974	6,042	5,551
43. " Nipissing	625	391	292	265	163	40	1,434	1,507	1,230
44. " Parry Sound	1,548	886	912	996	668	140	4,732	4,858	4,431
Total	69,248	46,728	57,830	61,586	57,031	14,879	294,762	298,966	282,953
Cities.									
1. Belleville	402	252	277	292	373		1,596	1,596	1,596
2. Brantford	609	347	418	796	496		2,666	2,666	2,666
3. Chatham	383	295	337	295	322		1,632	1,632	1,632
4. Guelph	382	206	210	495	368	143	1,804	1,804	1.801
5. Hamilton	2,143	1,194	1,207	2,257	1,677	474	8,250	8 952	8 952
6. Kingston	657	350	357	728	585		2,677	2,677	2,677
7. London	1,352	861	1,245	1,301	1,401		6,160	6,160	6,160
8. Ottawa	1,170	627	696	1,141	1,227	227	5,088	5,088	5,088
9. St. Catharines	430	297	257	359	261		1,604	1,604	1,604
10. St. Thomas	569	266	460	438	390		2,123	2,123	2,123
11. Stratford	277	227	223	417	434		1 578	1,578	1,578
12. Toronto	5,251	3,651	6,904	6,524	5,286	2,155	29,769	29,769	29,769
13. Windsor	830	427	477	326	246		2,306	2,306	2,306
Total	14,455	9,000	13,06	15,369	13,066	2,999	67,253	67 955	67 952

Public Schools.

different branches of instruction.

	Geography.	Music.	Grammar and Composition.	English History.	Canadian History.	Physiology and Temperance.	Drill and Calisthenics.	Bookkeeping.	Algebra.	Geometry.	Botany.	Elementary Physics.	Agriculture.
1	3,365	1,512	2,380	877	1,662	1,306	2,092	197	199	198	23	20	.....
2	8,444	6,673	7,877	3,287	5,457	8,329	5,329	556	587	575	46	132	52
3	4,555	2,383	4,440	1,714	2,521	2,208	1,606	313	321	297	13	24	10
4	3,709	2,397	3,258	1,082	1,308	1,437	2,687	241	264	266	10	59	4
5	3,446	3,118	3,069	1,634	2,111	2,447	3,515	284	297	299	46	99	186
6	3,575	1,626	3,311	1,017	1,211	1,279	1,095	244	236	235	39	36	.....
7	5,156	2,395	4,837	1,984	3,082	3,800	3,142	548	529	526	62	113	97
8	5,719	2,374	4,889	2,041	2,783	5,818	3,754	203	160	150	19	9	44
9	3,833	3,833	1,743	3,264	2,233	1,713	2,456	162	146	142	36	5	.....
10	2,566	811	2,263	841	907	967	940	102	103	102	...	9	....
11	10,267	6,032	9,126	2,693	5,370	9,365	7,366	488	491	469	45	158	80
12	3,626	2,687	3,367	1,275	1,663	1,830	2,457	210	183	183	52	65	....
13	2,337	955	1,909	777	873	791	822	191	51	41	9	1	1
14	2,518	1,519	2,517	1,140	1,517	1,483	1,771	266	261	251	7	1	.....
15	5,382	4,077	5,362	1,688	3,067	4,952	5,911	1,129	276	269	19	35	.....
16	9,122	5,275	8,050	3,812	5,573	4,634	4,985	883	886	875	33	178	.....
17	6,423	4,157	5,962	2,345	2,929	3,897	4,297	593	588	588	34	101	83
18	6,192	4,201	6,995	3,312	4,117	4,454	5,583	533	535	529	46	80	68
19	2,992	799	2,917	1,072	1,549	1,564	2,586	175	176	176	...	20	.....
20	6,817	2,800	6,313	3,270	3,814	3,246	2,695	447	379	374	11	40	20
21	3,489	1,266	3,111	1,905	2,113	2,653	2,009	276	171	171	24	28	2
22	2,983	1,541	2,746	1,205	1,618	1,680	1,937	118	86	72	1	1	24
23	9,056	5,726	8,577	3,226	4,018	5,901	5,061	619	605	568	15	14	9
24	4,518	3,401	3,875	1,850	2,112	2,245	4,133	287	239	244	7	25	31
25	4,93 3	3,025	4,270	1,294	1,923	1,914	1,854	384	264	241	7	16	...
26	5,090	2,146	4,755	2,344	2,967	2,794	2,367	399	349	371	29	44	21
27	5,686	2,555	5,016	2,433	3,224	3,006	2,575	548	544	507	99	149	6
28	3,077	1,211	2,704	1,315	1,894	1,597	2,180	268	256	256	.....	.....	.....
29	4,703	1,699	4,185	1,945	2,416	2,130	1,823	238	230	227	1	11	..
30	4,087	1,476	3,220	1,307	1,853	2,247	2,279	216	149	143	122	55	156
31	3,305	1,646	3,099	1,018	1,495	1,831	3,132	214	191	188	7	33	5
32	2,560	1,171	2,363	1,149	1,278	1,719	1,455	263	255	247	122	74	27
33	4,305	1,328	3,908	1,940	2,460	2,515	975	369	348	343	35	43	.....
34	10,111	8,962	9,980	4,294	6,298	5,390	11,604	1,248	973	962	76	150	10
35	2,845	1,009	2,710	901	1,175	1,176	1,442	146	124	124	70	42	4
36	4,929	2,450	4,611	1,977	2,408	2,102	2,557	354	353	351	230	85	28
37	4,815	4,858	4,350	959	2,101	1,602	2,006	236	209	209	19	13	3
38	3,855	1,309	3,578	1,760	2,396	2,256	1,238	339	289	246	...	42	21
39	6,008	3,157	5,379	2,403	3,739	3,391	2,917	410	409	385	39	64	3
40	3,650	1,799	3,401	1,518	2,134	1,540	1,513	364	296	286	58	8	112
41	8,668	6,016	8,395	2,746	3,655	4,436	5,288	534	426	413	159	75	...
42	3,758	1,555	3,295	1,272	1,907	1,979	1,595	189	153	151	41	31	18
43	1,737	177	684	221	337	305	267	73	38	37	2	2	...
44	2,842	992	2,545	906	1,389	1,157	1,496	137	133	131	12	16	79
	210,034	120,149	191,342	81,013	110,657	123,086	128,793	15,994	13,758	13,418	1,225	2,205	1,204
1	958	1,090	1,125	373	679	638	1,596	.....	.....	.....	.....	.....	.....
2	2,666	2,666	1,792	496	941	2,666	2,666	.....	.....	.....	.....	.....	.....
3	1,632	1,632	1,204	483	617	483	1,632	.....	.....	.....	.....	.....	.....
4	1,358	1,204	1,689	368	863	852	1,641	140	.....	.....	.....	.....	.....
5	6,661	8,832	6,809	2,305	3,261	6,809	8,952	472	463	463	2,049	114	.....
6	1,996	2,677	2,000	650	915	1,101	2,675	.....	.....	.....	.....	.....	.....
7	6,160	6,160	2,897	915	2,155	6,160	6,160	.....	.....	.....	.....	.....	.....
8	2,495	3,590	2,495	1,454	1,454	5,088	5,088	227	227	227	60	.....	.....
9	1,174	.....	1,174	261	404	404	.....	.....	.....	.....	.....	.....	.....
10	1,288	2,123	1,288	390	1,288	1,288	2,123	...	.....	.....	.....	.....	.....
11	1,448	1,578	1,133	434	609	968	1,578	.....	.....	.....	.....	.....	.....
12	29,574	28,081	29,620	4,744	7,695	18,462	28,914	4,187	2,151	2,151	1,030	665	.....
13	1,354	1,094	1,095	246	572	2,306	2,306	.....	.....	.....	.....	.....	.....
	58,767	60,727	54,321	13,119	21,453	47,225	65,331	5,026	2,841	2,841	3,139	779	.....

II.—TABLE B—

Towns.	Number of Pupils in the								
	Reading.								
	1st Reader Part I.	1st Reader Part II.	2nd Reader.	3rd Reader.	4th Reader.	5th Reader.	Writing.	Arithmetic.	Drawing.
1. Alliston	56	47	59	70	62	50	344	340	300
2. Almonte	75	62	79	81	97	.....	394	394	394
3. Amherstburg	71	50	65	35	47	22	290	290	290
4. Arnprior	171	76	127	96	100	.....	570	570	570
5. Aurora	41	71	88	63	70	.....	333	333	333
6. Aylmer	38	70	99	122	136	.....	465	465	465
7. Barrie	302	169	286	250	199	74	1,280	1,280	1 280
8. Berlin	281	284	318	289	203	.....	1,375	1,375	1,375
9. Blenheim	81	78	104	62	53	49	427	427	427
10. Bothwell	54	28	36	43	28	27	216	216	216
11. Bowmanville	113	99	105	110	134	.....	561	561	561
12. Bracebridge	218	132	161	140	47	49	564	564	564
13. Brampton	125	98	101	136	112	.....	572	572	521
14. Brockville	306	224	319	320	214	.....	1,383	1,383	1,382
15. Carleton Place	251	130	140	142	190	.....	853	853	853
16. Clinton	81	84	99	152	102	.....	518	518	518
17. Cobourg	101	107	113	158	144	.....	623	623	623
18. Collingwood	314	170	240	240	301	.....	1,265	1,265	1,265
19. Cornwall	182	104	136	120	114	.....	656	656	656
20. Deseronto	236	110	134	93	107	.....	680	680	680
21. Dresden	118	79	58	70	67	53	445	445	400
22. Dundas	146	108	63	124	110	.....	551	551	464
23. Durham	69	68	63	67	64	78	409	409	371
24. Essex	115	49	69	82	57	.....	372	372	372
25. Forest	80	69	53	71	68	.....	341	341	305
26. Fort William	259	165	129	57	97	.....	707	707	707
27. Galt	310	189	236	326	343	35	1,317	1,439	1,317
28. Gananoque	174	124	168	170	142	.....	778	778	778
29. Goderich	119	113	175	242	91	.....	740	740	508
30. Gore Bay	48	51	140	164	104	22	529	529	529
31. Gravenhurst	342	118	98	93	111	.....	762	762	762
32. Harriston	81	61	91	70	120	.....	423	423	423
33. Ingersoll	113	184	198	135	143	.....	773	773	773
34. Kincardine	104	58	91	128	118	.....	499	499	499
35. Leamington	89	145	98	69	128	.....	529	529	529
36. Lindsay	212	133	213	292	218	.....	1,068	1,068	1,068
37. Listowel	164	69	118	138	131	.....	620	620	620
38. Little Current	47	33	44	29	20	28	201	201	201
39. Mattawa	31	12	23	22	20	15	116	123	116
40. Meaford	113	49	106	94	63	.....	425	425	425
41. Midland	189	75	147	110	99	41	652	652	652
42. Milton	92	58	74	31	56	59	370	370	370
43. Mitchell	97	56	66	129	126	.....	474	474	474
44. Mount Forest	91	68	129	100	127	.....	515	515	515
45. Napanee	129	59	114	150	203	.....	655	655	655
46. Newmarket	104	41	88	88	74	.....	395	395	395
47. Niagara	47	39	59	73	80	.....	298	298	298
48. Niagara Falls	184	54	110	133	152	.....	633	633	449
49. North Bay	173	60	60	62	61	37	453	453	453
50. North Toronto	143	74	90	72	53	18	450	450	450
51. Oakville	87	61	59	55	57	.....	319	319	319
52. Orangeville	109	124	96	106	116	.....	551	551	551
53. Orillia	220	128	222	368	189	59	1,086	1,086	1,086
54. Oshawa	149	110	173	212	151	.....	795	795	795
55. Owen Sound	304	197	330	300	306	.....	1,437	1,437	1,437
56. Palmerston	124	58	67	76	117	62	504	504	485
57. Parkhill	34	28	50	73	73	.....	258	258	258
58. Paris	100	114	99	184	105	.....	602	602	602
59. Parry Sound	252	104	103	100	93	65	717	717	638
60. Pembroke	171	87	85	109	190	.....	642	642	642
61. Penetanguishene	158	44	37	43	.....	.....	282	282	80

The Public Schools.

different branches of Instruction.

	Geography.	Music.	Grammar and Composition.	English History.	Canadian History.	Physiology and Temperance.	Drill and Calisthenics.	Book-keeping.	Algebra.	Geometry.	Botany.	Elementary Physics.	Agriculture.
1	300	300	344	108	178	300	344	22	64	64	3	44	.....
2	292	.....	292	140	140	97	.....	.....	.....	.....	.....	.....	.....
3	169	115	145	69	104	290	220	22	22	22	3	3	40
4	323	570	570	100	196	570	570	.....	.....	.....	.....	.....	.....
5	333	263	333	70	133	133	263	.....	.....	.....	.....	.....	.....
6	465	207	465	136	238	248	309	.....	.....	.....	.....	.....	.....
7	1,280	1,280	523	523	523	962	1,280	748	74	74	.....	.....	.....
8	810	810	492	203	492	492	.....	.....	.....	.....	.....	.....	.....
9	371	214	322	102	164	219	263	49	49	49	.....	.....	.....
10	216	216	146	55	55	98	98	27	27	27	.....	.....	.....
11	375	509	561	134	244	561	561	.....	.....	.....	.....	.....	.....
12	237	220	329	96	148	148	269	39	49	49	.....	10	.....
13	409	572	404	112	147	147	572	.....	.....	.....	.....	.....	.....
14	851	952	1,383	368	368	534	1,383	.....	.....	.....	.....	.....	.....
15	602	.....	472	190	244	190	853	.....	.....	.....	.....	.....	.....
16	437	518	254	102	186	77	518	.....	.....	.....	.....	.....	.....
17	623	623	302	144	302	144	623	.....	.....	.....	.....	.....	.....
18	767	1,023	781	504	577	1,265	1,265	.....	.....	.....	.....	.....	.....
19	474	656	474	114	175	656	656	.....	.....	.....	.....	.....	.....
20	334	323	451	107	200	200	417	.....	.....	.....	.....	.....	.....
21	296	350	296	96	190	190	190	40	53	53	.....	32	.....
22	297	551	297	64	234	64	551	.....	.....	.....	.....	.....	.....
23	302	.....	310	142	209	234	340	40	78	78	.....	38	.....
24	372	372	372	57	139	372	304	.....	.....	.....	.....	.....	.....
25	192	341	341	68	139	139	341	.....	.....	.....	.....	.....	.....
26	443	514	448	29	154	154	282	.....	.....	.....	.....	.....	.....
27	1,129	777	880	244	699	746	.....	35	35	35	.....	.....	.....
28	778	337	480	142	312	480	274	.....	.....	.....	.....	.....	.....
29	508	740	333	173	173	91	.....	.....	.....	.....	.....	.....	.....
30	529	.....	188	104	104	65	.....	21	40	40	.....	14	.....
31	762	.....	302	111	186	188	295	.....	.....	.....	.....	.....	.....
32	342	281	342	120	190	225	306	.....	.....	.....	.....	.....	.....
33	773	773	773	143	237	773	773	.....	.....	.....	.....	.....	.....
34	382	153	499	118	246	269	.....	62	.....	.....	.....	.....	.....
35	529	529	529	128	197	529	59	.....	.....	.....	.....	.....	.....
36	717	264	773	218	324	265	243	.....	.....	.....	.....	.....	.....
37	387	620	387	131	199	269	.....	.....	.....	.....	.....	.....	.....
38	121	153	121	77	77	48	48	28	28	28	16	10	.....
39	116	.....	123	46	65	58	123	8	15	15	.....	8	.....
40	425	425	425	63	210	210	425	.....	.....	.....	.....	.....	.....
41	652	590	652	241	241	453	611	41	41	41	.....	15	.....
42	370	370	370	115	146	370	370	96	59	59	.....	22	.....
43	377	97	321	126	201	126	.....	.....	.....	.....	.....	.....	.....
44	352	.....	352	185	227	515	48	.....	.....	.....	.....	.....	.....
45	655	655	655	353	353	467	655	.....	.....	.....	.....	.....	.....
46	250	321	314	74	112	74	204	.....	.....	.....	.....	.....	.....
47	178	218	193	80	153	224	218	.....	.....	.....	.....	.....	.....
48	449	.....	395	152	285	152	.....	.....	.....	.....	.....	.....	.....
49	210	453	453	108	180	453	453	37	47	47	.....	17	.....
50	450	450	450	71	143	71	450	18	18	18	.....	.....	.....
51	176	319	176	57	112	176	207	.....	2	.....	.....	.....	.....
52	442	503	551	116	222	318	551	.....	.....	.....	.....	.....	.....
53	866	903	813	302	516	579	566	254	59	59	.....	.....	.....
54	484	.....	429	85	284	151	263	.....	.....	.....	.....	.....	.....
55	996	1,437	996	306	606	606	1,437	.....	.....	.....	.....	.....	.....
56	380	325	380	255	122	.....	43	62	62	.....	19	.....	.....
57	196	258	146	73	146	73	.....	.....	.....	.....	.....	.....	.....
58	388	51	289	105	214	602	.....	.....	.....	.....	.....	.....	.....
59	340	207	335	158	237	193	600	44	6	65	.....	21	.....
60	642	642	471	109	299	299	642	.....	.....	.....	.....	.....	.....
61	80	200	80	43	43	.....	.....	.....	.....	.....	.....	.....	.....

II.—TABLE B.—

Towns.	Number of pupils in the								
	Reading.								
	1st Reader Part I.	1st Reader Part II.	2nd Reader.	3rd Reader.	4th Reader.	5th Reader.	Writing.	Arithmetic.	Drawing.
62. Perth	100	74	128	136	133	..	571	571	571
63. Peterborough	403	319	337	318	343	..	1,720	1,720	1,720
64. Petrolea	282	167	159	240	226	..	1,074	1,074	1,647
65. Picton	137	94	97	168	149	..	645	645	645
66. Port Arthur	202	65	54	57	88	..	466	466	466
67. Port Hope	203	146	212	150	179	..	890	890	690
68. Prescott	91	62	61	60	99	..	373	373	373
69. Rat Portage	284	172	125	145	74	70	870	870	870
70. Renfrew	118	57	47	98	143	..	463	463	463
71. Ridgetown	138	66	108	102	132	..	546	546	546
72. Sandwich	80	36	83	53	39	..	291	291	291
73. Sarnia	355	174	256	193	337	2	1,317	1,317	1,317
74. Sault Ste. Marie	303	108	128	111	99	65	749	814	804
75. Seaforth	73	79	52	105	124	35	468	468	468
76. Simcoe	99	63	110	121	138	..	521	521	521
77. Smith's Falls	327	131	189	162	158	..	967	967	967
78. Stayner	132	15	51	50	57	50	355	355	355
79. Sturgeon Falls	35	18	17	17	16	2	102	102	102
80. St. Marys	107	121	128	268	162	..	769	769	631
81. Strathroy	131	88	106	111	138	..	574	574	574
82. Sudbury	46	28	30	39	36	25	204	204	204
83. Thessalon	91	26	41	49	36	18	261	261	261
84. Thornbury	50	31	41	34	44	20	220	220	220
85. Thorold	70	63	88	89	75	..	385	385	385
86. Tilsonburg	75	55	94	87	133	..	444	444	444
87. Toronto Junction	503	289	325	335	244	5	1,701	1,701	1,701
88. Trenton	162	139	161	114	82	..	658	658	658
89. Uxbridge	81	98	97	111	59	..	446	446	446
90. Vankleekhill	49	22	34	38	41	..	184	184	184
91. Walkerton	117	70	128	109	110	..	534	534	534
92. Walkerville	58	36	46	49	52	..	241	241	241
93. Wallaceburg	172	103	98	140	47	89	550	634	610
94. Waterloo	123	86	148	152	116	..	625	625	625
95. Welland	77	89	60	116	60	..	402	402	402
96. Whitby	104	50	77	112	133	..	476	476	476
97. Wiarton	142	117	137	96	78	..	570	570	428
98. Wingham	102	67	117	117	64	77	544	542	544
99. Woodstock	452	302	338	324	318	..	1,734	1,734	1,734
Total	14,862	9,435	11,809	12,405	11,656	1,301	60,972	61,286	59,563
Totals.									
1. Counties, etc	69,248	46,728	57,830	61,586	57,031	14,879	294 762	298,966	282 953
2. Cities	14,455	9,000	13,168	15,369	13,066	2,999	67,253	67 955	67,972
3. Towns	14,862	9,435	11,809	12,405	11,656	1 301	60,972	61,286	59,563
4, Grand Total, 1898	98,565	65,163	82,707	89,360	81,753	19,179	422 987	428,207	410 468
5. Grand Total, 1897	100,075	65,482	83,423	90,942	81,823	19,412	425,801	431,704	411,982
6. Increase	..	..	..	..	..	..	..	..	..
7. Decrease	1,510	319	716	1,582	70	233	2,814	3,497	1,514
8. Percentage	23	15	19	20	19	4	97	98	94

The Public Schools.

different branches of instruction.

	Geography.	Music.	Grammar and Composition.	English History.	Canadian History.	Physiology and Temperance.	Drill and Calisthenics.	Book-keeping.	Algebra.	Geometry.	Botany.	Elementary Physics.	Agriculture.
62	397	.....	339	133	191	133	571	.....	.....	.....	.....	.....	.....
63	998	.....	1,720	285	661	661	1,366	.....	.....	.....	.....	.....	.....
64	849	1,074	1,074	226	466	601	1,074	.....	.....	.....	.....	.....	.....
65	499	586	499	199	266	506	334	.....	.....	.....	.....	.....	.....
66	299	.....	233	65	145	.....	.....	.....	.....	.....	.....	.....	.....
67	541	494	541	179	262	329	451	.....	.....	.....	.....	.....	.....
68	210	.....	272	159	159	159	.....	.....	.....	.....	.....	.....	.....
69	436	43	289	289	289	870	43	34	70	70	34	23	.....
70	317	463	241	143	241	241	.....	.....	.....	.....	.....	.....	.....
71	408	414	546	234	234	186	414	.....	.....	.....	.....	.....	.....
72	261	60	188	39	66	72	60	.....	.....	.....	.....	.....	.....
73	828	1,111	1,059	532	532	1,168	1,174	48	24	10	.....	.....	.....
74	501	477	511	201	231	336	226	55	65	65	3	21	.....
75	468	236	349	113	159	56	289	35	35	35	.....	.....	.....
76	422	521	360	138	249	521	521	.....	.....	.....	.....	.....	.....
77	967	967	967	158	230	967	967	.....	.....	.....	.....	.....	.....
78	355	.....	208	50	157	132	.....	42	50	50	.....	18	.....
79	102	.....	102	34	34	34	.....	2	4	4	.....	2	.....
80	558	91	456	162	430	71	140	.....	.....	.....	.....	.....	.....
81	355	574	355	73	249	574	574	.....	.....	.....	.....	.....	.....
82	130	.....	204	61	93	32	.....	18	25	25	.....	7	.....
83	261	261	170	54	103	261	.....	27	17	17	6	6	.....
84	220	.....	220	64	98	220	220	38	38	38	38	38	.....
85	385	.....	316	75	164	252	69	.....	.....	.....	.....	.....	.....
86	314	444	314	176	176	256	369	.....	.....	.....	.....	.....	.....
87	934	1,634	1,190	259	553	435	1,701	5	5	5	.....	.....	.....
88	426	85	414	82	201	201	218	.....	.....	.....	.....	.....	.....
89	446	446	288	170	170	288	446	.....	.....	.....	.....	.....	.....
90	135	184	184	41	41	41	100	.....	.....	.....	.....	.....	.....
91	417	325	534	110	239	534	534	.....	.....	.....	.....	.....	.....
92	241	.....	183	52	101	183	94	.....	.....	.....	.....	.....	.....
93	476	649	649	148	211	115	649	35	89	89	.....	52	.....
94	416	178	502	116	184	116	123	.....	.....	.....	.....	.....	.....
95	365	200	365	60	160	402	402	.....	.....	.....	.....	.....	.....
96	428	476	476	245	245	476	476	.....	.....	.....	.....	.....	.....
97	286	328	378	78	174	378	174	.....	.....	.....	.....	.....	.....
98	442	567	375	147	2 8	104	.....	77	77	77	.....	31	.....
99	1,282	1,734	652	318	652	998	1,734	.....	.....	.....	.....	.....	.....
	45,380	39,172	43,836	14,433	23,013	31,501	37,849	2,109	1,386	1,308	122	432	40
1	210,034	120,149	191,342	81,013	110,657	123,086	128,793	15,994	13 758	13.418	1,225	2,205	1,204
2	58,767	60,727	54 321	13,119	21,153	47,22	65.331	5,026	2,841	2 841	3.139	779	.....
3	45,380	39,172	43,836	14,433	23,013	31,501	37.849	2,109	1,386	1,308	122	432	40
4	314,181	220,048	289,499	108,565	155,123	201,81	231,973	23,1 9	17 985	17,567	4,486	3,416	1,244
5	314,718	208,078	290,716	107,570	156,493	197,216	241,482	23.668	17.984	17,166	5,161	4,100	2,189
6	.....	11,970	....	995	.....	4,596	.....	.....	1	401	...	.....	.....
7	537	.....	1,217	.....	1,370	.....	9,509	539	.....	...	675	684	945
8	72	51	66	25	36	46	53	5	4	4	1	1	½

III.—TABLE C.—The

Public School

Counties. (Including incorporated villages, but not cities or towns.)	Total number. Public school Teachers.	Male.	Female.	Average salaries. Highest salary paid.	Average salary, male teacher.	Average salary, female teacher
				$	$	$
1 Brant	69	24	45	575	405	290
2 Bruce	217	91	126	725	342	241
3 Carleton	132	50	82	600	346	259
4 Dundas	105	49	56	700	321	250
5 Dufferin	96	30	66	600	326	267
6 Durham	115	52	63	550	338	262
7 Elgin	131	51	80	535	364	273
8 Essex	148	64	84	650	371	273
9 Frontenac	149	38	111	450	261	220
10 Glengarry	83	20	63	550	319	244
11 Grey	244	90	154	600	333	248
12 Haldimand	101	39	62	700	354	272
13 Haliburton and N. E. Muskoka	107	12	95	600	291	196
14 Halton	76	35	41	600	360	278
15 Hastings	201	55	146	700	348	253
16 Huron	220	118	102	700	356	251
17 Kent	148	58	90	600	357	286
18 Lambton	199	67	132	600	380	263
19 Lanark	132	26	106	600	286	228
20 Leeds and Grenville	257	68	189	700	292	230
21 Lennox and Addington	125	34	91	650	309	225
22 Lincoln	83	39	44	600	379	271
23 Middlesex	210	91	119	525	346	265
24 Norfolk	121	54	67	600	321	248
25 Northumberland	130	52	78	700	350	248
26 Ontario	139	70	69	800	378	271
27 Oxford	137	81	56	610	389	270
28 Peel	87	40	47	600	350	281
29 Perth	120	59	61	550	365	280
30 Peterborough	114	38	76	650	324	241
31 Prescott and Russell	116	29	87	*1,200	342	225
32 Prince Edward	82	31	51	550	314	250
33 Renfrew	150	30	120	500	284	211
34 Simcoe and W. Muskoka	273	124	149	750	340	262
35 Stormont	87	27	60	450	316	237
36 Victoria and S. E. Muskoka	151	55	96	575	332	237
37 Waterloo	134	64	70	750	408	266
38 Welland	101	36	65	720	372	269
39 Wellington	166	88	78	650	368	267
40 Wentworth	95	48	47	500	301	271
41 York	205	93	112	850	391	283
42 Dist. Algoma	134	57	77	700	307	265
43 " Nipissing	53	11	42	500	273	204
44 " Parry Sound	139	34	105	600	318	225
Total	6,082	2,322	3,760	800	346	250

* Plantagenet Training School.

Public Schools.

teachers.

	Attended a Normal School.	Certificates.							
	Number of teachers who have attended a Normal School.	Total number of certificates.	Provincial 1st class.	Provincial 2nd class.	1st class old County Board.	2nd class old County Board.	3rd class.	Temporary certificates.	Other certificates.
1	38	69	6	32	.....	.....	31	.....	.....
2	52	217	6	48	.....	.....	163	.....	.....
3	38	132	3	36	1	.....	90	2	.....
4	28	105	2	26	1	.....	76	.....	.....
5	22	96	3	20	.....	.....	73	.....	.....
6	45	115	3	42	.....	1	69	.....	.....
7	38	131	6	39	.....	.....	86	.....	.....
8	35	148	5	46	.....	.....	89	8	.....
9	35	149	2	33	.....	1	112	1	.....
10	18	83	1	17	.....	.....	65	.....	.....
11	59	244	2	65	.....	.....	177	.....	.....
12	36	101	8	28	1	.....	64	.....	.....
13	7	107	2	12	.....	.....	79	14	.....
14	23	76	1	23	1	.....	51	.....	.....
15	53	201	1	52	.....	.....	148	.....	.....
16	81	220	6	81	.....	.....	133	.....	.....
17	46	148	1	45	.....	.....	102	.....	.....
18	75	199	.....	76	.....	.....	123	.....	.....
19	21	132	2	19	1	.....	109	1	.....
20	50	257	5	47	.....	.....	205	.....	.....
21	19	125	4	15	.....	2	104	.....	.....
22	35	83	5	32	1	.....	45	.....	.....
23	96	210	4	95	.....	.....	111	.....	.....
24	36	121	6	33	.....	3	79	.....	.....
25	44	130	2	44	.....	3	81	.....	.....
26	43	139	6	48	.....	.....	85	.....	.....
27	53	137	10	45	1	.....	81	.....	.....
28	39	87	3	36	.....	.....	48	.....	.....
29	51	120	4	52	.....	.....	64	.....	.....
30	35	114	2	37	.....	1	74	.....	.....
31	11	116	3	10	.....	.....	102	1	.....
32	22	82	3	19	.....	.....	59	1	.....
33	11	150	1	10	.....	.....	139	.....	.....
34	74	273	9	67	1	1	195	.....	.....
35	21	87	2	20	.....	1	63	1	.....
36	28	151	1	28	.....	.....	122	.....	.....
37	73	134	5	68	.....	.....	59	2	.....
38	28	101	2	29	4	.....	66	.....	.....
39	62	166	3	64	1	.....	97	1	.....
40	45	95	8	38	1	.....	48	.....	.....
41	91	205	1	101	2	.....	101	.....	.....
42	17	134	8	48	1	.....	73	4	.....
43	4	53	1	9	.....	.....	34	9	.....
44	13	139	5	28	.....	.....	105	1	.....
	1,751	6,082	163	1,763	17	13	4,080	46	.....

III.—TABLE C.—The

Totals.	Public School					
	Total number.			Average salaries.		
	Public School teachers.	Male.	Female.	Highest salary paid.	Average salary, male teacher..	Average salary, female teacher.
				$	$	$
1 Counties, etc	6,082	2,322	3,760	800	346	250
2 Cities	1,372	150	1,222	1,500	888	448
3 Towns	1,011	184	827	1,150	626	291
4 Grand Total, 1898	8,465	2,656	5,809	1,500	396	293
5 " 1897	8,376	2,690	5,686	1,500	391	294
6 Increase	89		123		5	
7 Decrease		34				1
8 Percentage		31	69			

Public Schools.

teachers.

	Attended a Normal School.	Certificates.							
	Number of teachers who have attended a Normal School.	Total number of certificates.	Provincial 1st class.	Provincial 2nd class.	1st class old County Board.	2nd class old County Board.	3rd class.	Temporary certificates.	Other certificates.
1	1,751	6,082	163	1,763	17	13	4,080	46	.....
2	1,105	1,372	171	948	14	7	61	.....	171
3	729	1.011	98	699	13	4	192	5	.....
4	3,585	8,465	432	3,410	44	24	4,333	51	171
5	3,479	8,376	337	3,336	53	32	4,345	55	218
6	106	89	95	74	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	9	8	12	4	47
8	43	.....	4	41	½	½	52	½	2

IV.—TABLE D.—The

Totals.	Number of Schools open.	School houses.					School visits.				
		Brick.	Stone.	Frame.	Log.	Total.	Inspectors.	Trustees.	Clergymen.	Other persons.	Total.
1 Counties, etc	5,199	2,064	447	2,317	371	5,199	10,931	8,531	3,745	26,404	49,611
2 Cities	171	148	17	6	....	171	3,363	2,633	510	11,438	17,944
3 Towns	217	162	23	32	.....	217	1,912	2,782	445	5,481	10,620
4 Grand Total, 1898	5,587	2,374	487	2,355	371	5,587	16,206	13,946	4,700	43,323	78 ,
5 " 1897	5,574	2,359	485	2,359	371	5,574	14,914	14,961	4,714	46,991	81,580
6 Increase	13	15	2	.....	....	13	1,292	.....	.....	.....	.....
7 Decrease	..	.....	.....	4	.....	.....	....	1,015	14	3,668	3,405
8 Percentage	.....	42	9	42	7	....	18	18	6	58	.....

Public Schools.

	Maps, globes.		Examinations, prizes.		Lectures.			Trees.	Prayers.			
	Total number of maps.	Total number of globes.	Number of examinations.	No. of schools distributing prizes.	Inspectors.	Other persons.	Total.	No. of trees planted on Arbor Day.	No. of schools using authorized Scripture readings.	No. opened and closed with prayer.	No. using Bible.	No. imparting religious instruction.
1	41,879	4,123	2,558	497	998	184	1,182	12,244	3,101	5,091	2,066	771
2	9,098	257	8	24	13	8	21	.....	79	171	145	7
3	2,767	318	175	30	43	39	82	114	134	205	150	25
4	53,744	6,698	2,741	551	1,054	231	1,285	12,358	3,314	5,467	2,361	803
5	51,110	6,527	2,989	636	298	397	695	15,491	3,172	5,320	2,451	761
6	2,634	171	.....	....	756	.....	590	.....	142	147	.. ..	42
7	.....	.....	248	115	.....	166	.....	3,133	.....	.....	90	.... ..
8	*9	*1.5	.....	10	43	57	.....	.....	59	97	42	14

* To each school.

V.—TABLE E—The

Counties. (Including incorporated villages, but not cities or towns.)	Receipts. Legislative grants.	Municipal grants and assessments.	Clergy reserve fund, balances and other sources.	Total receipts for all Public School purposes.
	$ c.	$ c.	$ c.	$ c.
1 Brant	2,386 00	22,724 55	15,044 56	40,155 11
2 Bruce	7,925 00	73,294 58	26,327 99	107,547 57
3 Carleton	4,999 00	44,440 21	24,052 41	73,491 62
4 Dundas	3,128 00	33,845 53	12,402 73	49,376 26
5 Dufferin	3,324 00	29,722 87	12,384 06	45,430 93
6 Durham	3,645 00	38,776 50	12,214 27	54,635 77
7 Elgin	4,707 00	44,557 08	26,366 34	75,630 42
8 Essex	4,879 34	56,961 46	18,323 05	80,163 85
9 Frontenac	3,848 00	32,467 73	16,610 69	52,926 42
10 Glengarry	2,808 00	26,359 96	6,422 57	35,590 53
11 Grey	8,765 00	75,215 26	28,324 95	112,305 21
12 Haldimand	3,192 00	34,109 51	14,294 74	51,596 25
13 Haliburton and N. E. Muskoka	7,782 00	18,721 72	10,794 24	37,297 96
14 Halton	2,763 00	22,664 52	13,263 30	38,690 82
15 Hastings	7,354 44	44,535 24	42,934 41	94,824 09
16 Huron	8,773 00	75,903 15	27,653 35	112,329 50
17 Kent	6,084 00	58,355 34	37,090 52	101,529 86
18 Lambton	6,823 00	64,186 28	30,152 55	101,161 83
19 Lanark	4,368 00	33,497 18	13,368 26	51,233 44
20 Leeds and Grenville	6,987 00	69,625 96	28,661 72	105,274 68
21 Lennox and Addington	3,569 00	30,781 94	14,146 41	48,497 35
22 Lincoln	2,786 00	31,990 47	12,414 80	47,191 27
23 Middlesex	7,728 00	72,401 91	39,729 87	119,859 78
24 Norfolk	3,892 00	36,845 79	28,208 09	68,945 88
25 Northumberland	4,571 00	44,500 34	17,722 51	66,793 85
26 Ontario	5,588 00	44,075 20	22,853 39	72,516 59
27 Oxford	5,272 00	53,464 26	36,311 33	95,047 59
28 Peel	3,034 00	30,845 87	15,342 15	49,222 02
29 Perth	4,328 00	45,320 86	16 920 74	66,569 60
30 Peterborough	4,289 00	31,523 77	12,646 39	48,459 16
31 Prescott and Russell	4,343 00	30,305 45	15,360 64	50,009 09
32 Prince Edward	2,359 00	24,099 04	8,280 58	34,738 62
33 Renfrew	6,625 00	33,504 81	12,516 49	52,646 30
34 Simcoe and W. Muskoka	14,202 00	87,135 90	37,115 22	138,453 12
35 Stormont	2,624 00	26,186 19	5,279 70	34,089 89
36 Victoria and S. E. Muskoka	8,344 00	40,688 83	15,323 88	64,356 71
37 Waterloo	4,811 00	56,121 41	35,361 57	96,293 98
38 Welland	3,635 00	32,352 92	22,537 09	58,525 01
39 Wellington	6,406 00	57,063 51	25,344 73	88,814 24
40 Wentworth	3,682 00	34,283 31	35,191 99	73,157 30
41 York	7,307 00	75,372 08	53,603 27	136,282 35
42 District of Algoma	18,345 00	38,977 22	19,113 14	76,435 36
43 " Nipissing	2,770 00	7,074 28	3,859 81	13,704 09
44 " Parry Sound	10,218 00	24,882 02	9,702 92	44,802 94
Total	245,268 78	1,889,762 01	931,573 42	3,066,604 21
Cities.				
1 Belleville	1,157 00	13,143 45	713 49	15,013 94
2 Brantford	2,265 00	24,150 25	24,476 93	50,892 18
3 Chatham	1,219 00	11,640 48	1,139 57	13,999 05
4 Guelph	1,295 00	15,362 84	538 28	17,196 12
5 Hamilton	6,648 00	103,861 78	57,087 76	167,597 54
6 Kingston	2,272 00	25,400 00	1,231 79	28,903 79
7 London	4,993 00	74,061 00	11,532 27	90,586 27
8 Ottawa	3,981 00	117,037 00	4,137 08	125,155 08
9 St. Catharines	1,055 00	13,377 00	565 00	14,997 00
10 St. Thomas	1,578 00	14,828 01	36,805 36	53,211 37
11 Stratford	1,450 00	14,150 00	1,499 95	17,099 95
12 Toronto	23,393 00	504,800 00	17,988 83	546,181 83
13 Windsor	1,885 00	26,448 01	306 15	28,639 16
Total	53,191 00	958,259 82	158,022 46	1,169,473 28

Public Schools.

Expenditure.

	Teachers' salaries.	Sites and building school houses.	Maps, apparatus, prizes and libraries.	Rent and repairs, fuel and other expenses.	Total expenditure for all Public School purposes.	Balances.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1	22,704 02	756 82	465 34	6,350 24	30,276 42	9,878 69
2	60,680 28	7,138 65	938 69	15,560 82	84,318 44	23,229 13
3	40,034 91	11,130 46	1,068 09	10,359 76	62,593 22	10,898 40
4	29,475 77	7,089 15	536 04	6,152 03	43,252 99	6,123 27
5	26,596 96	2,438 14	657 25	6,407 21	36,099 56	9,331 37
6	33,638 72	1,119 44	677 20	6,832 44	42,267 80	12,367 97
7	40,219 52	2,271 77	583 56	11,228 36	54,303 21	21,327 21
8	45,976 29	3,400 48	1,241 50	11,327 50	61,945 77	18,218 08
9	32,927 73	1,658 06	883 60	7,077 76	42,547 15	10,379 27
10	21,509 92	677 38	1,135 02	6,744 19	30,037 01	5,523 52
11	67,998 51	7,894 99	1,073 32	14,845 65	91,812 47	20,492 74
12	30,192 20	1,363 18	819 95	7,107 15	39,482 48	12,113 77
13	21,172 04	5,702 81	1,119 93	4,186 79	32,181 57	5,116 39
14	23,874 24	872 64	319 40	6,261 19	31,327 47	7,363 35
15	55,395 81	10,534 15	808 53	9,416 00	76,154 49	18,669 60
16	66,882 79	3,543 03	966 46	15,060 09	86,452 37	25,877 13
17	46,765 26	3,772 23	889 07	13,309 05	64,735 61	36,794 25
18	59,268 53	3,449 62	844 97	14,386 24	77,949 36	23,212 47
19	31,114 10	638 97	517 20	6,769 42	39,039 69	12,193 75
20	63,413 08	7,614 97	921 40	15,648 49	87,597 94	17,676 74
21	29,975 43	2,431 54	727 48	6,127 29	39,261 74	9,235 61
22	26,720 13	1,860 91	249 10	7,144 49	35,974 63	11,216 64
23	62,646 60	8,803 37	1,205 79	17,945 55	90,601 31	29,258 47
24	34,289 15	2,473 87	873 76	7,113 53	44,750 31	24,195 57
25	37,312 75	2,765 65	805 37	12,651 67	53,535 44	13,258 41
26	44,236 35	1,309 47	1,042 37	11,825 95	58,414 14	14,102 45
27	46,156 12	3,466 46	1,755 83	10,923 91	62,302 32	32,745 27
28	27,115 06	2,630 98	1,009 28	6,783 76	37,539 08	11,682 94
29	37,874 71	4,466 79	723 92	8,131 98	51,197 40	15,372 20
30	31,090 61	1,060 79	745 87	7,183 98	40,081 25	8,377 91
31	29,206 97	4,156 83	976 87	6,251 67	40,592 34	9,416 75
32	22,864 97	507 64	119 38	4,206 67	27,698 66	7,039 96
33	32,870 02	3,031 38	790 40	6,575 76	43,267 56	9,378 74
34	80,832 55	8,516 98	1,620 77	14,372 87	105,343 17	33,109 95
35	22,614 51	2,322 39	954 50	3,935 96	29,827 36	4,262 53
36	39,539 99	1,316 98	1,343 43	8,276 62	50,477 02	13,879 69
37	45,399 40	5,297 90	752 65	11,104 41	62,554 36	33,739 62
38	31,798 33	1,219 58	681 94	7,680 85	41,380 70	17,144 31
39	49,954 80	1,457 28	909 19	13,950 57	66,271 84	22,542 40
40	31,023 48	14,399 78	904 85	8,653 33	54,981 44	18,175 86
41	68,584 90	11,777 25	1,897 92	21,238 01	103,498 08	32,784 27
42	37,311 00	8,332 07	2,256 64	9,856 12	57,755 83	18,679 53
43	7,211 24	2,556 05	499 16	2,256 42	12,522 87	1,181 22
44	26,917 49	4,541 24	962 86	7,078 99	39,500 58	5,302 36
	1,723,387 24	183,770 12	40,276 35	416,300 74	2,363,734 45	702,869 76
1	10,128 00	.....	.....	4,057 60	14,185 60	828 34
2	18,933 06	17,393 13	1,606 55	12,833 34	50,766 08	126 10
3	9,996 01	.....	28 68	3,677 15	13,701 84	297 21
4	12,630 56	.....	168 07	4,166 31	16,964 94	231 18
5	78,674 90	21,454 06	6,484 34	60,925 65	167,538 95	58 59
6	23,507 80	.....	1,473 72	3,641 22	28,622 74	281 05
7	59,101 59	9,611 05	359 00	20,603 75	89,675 39	910 88
8	49,908 35	30,731 02	136 13	26,411 87	107,187 37	17,967 71
9	10,339 67	.....	166 40	4,162 26	14,668 33	328 67
10	12,932 00	35,710 80	14 45	3,855 96	52,513 21	698 16
11	10,856 43	647 53	1,183 56	4,202 01	16,889 53	210 42
12	330,321 25	87,970 56	882 55	108,924 49	528,098 85	18,082 98
13	19,204 49	1,220 13	167 65	7,713 56	28,305 83	333 33
	646,534 11	204,738 28	12,671 10	265,175 17	1,129,118 66	40,354 62

V—TABLE E—The

	Towns.	Receipts.			
		Legislative grants.	Municipal grants and assessments.	Clergy reserve fund, balances and other sources.	Total receipts for all Public School purposes.
		$ c.	$ c.	$ c.	$ c.
1	Alliston	227 00	1,600 00	475 91	2,302 91
2	Almonte	272 00	3,699 95	786 57	4,758 32
3	Amherstburg	156 00	2,482 68	97 18	2,735 86
4	Arnprior	286 00	2,534 99	1,504 34	4,325 33
5	Aurora	188 00	2,150 00	794 31	3,132 31
6	Aylmer	303 00	4,154 83	277 71	4,735 54
7	Barrie	821 00	9,402 93	194 50	10,418 43
8	Berlin	1,118 00	14,103 95	59 25	15,281 20
9	Blenheim	189 00	3,140 52	356 97	3,686 49
10	Bothwell	136 00	1,989 00	58 62	2,183 62
11	Bowmanville	360 00	5,100 00	129 95	5,589 95
12	Bracebridge	497 00	3,058 75	697 20	4,252 95
13	Brampton	513 00	4,338 00	321 99	5,172 99
14	Brockville	966 00	13,000 00	385 40	14,351 40
15	Carleton Place	531 00	5,000 00	1,962 12	7,493 12
16	Clinton	466 00	3,000 00	669 03	4,135 03
17	Cobourg	521 00	4,940 00	335 02	5,796 02
18	Collingwood	811 00	10,100 00	307 83	11,218 83
19	Cornwall	489 00	6,629 51	928 11	8,046 62
20	Deseronto	393 00	4,922 10	903 45	6,218 55
21	Dresden	216 00	3,184 00	4,119 67	7,519 67
22	Dundas	419 00	4,944 00	263 39	5,626 39
23	Durham	309 00	1,773 84	1,024 15	3,106 99
24	Essex	187 00	....	2,166 45	2,353 45
25	Forest	343 00	2,550 00	413 12	3,306 12
26	Fort William	196 00	6,837 95	334 38	7,368 33
27	Galt	1,054 00	11,700 00	403 55	13,157 55
28	Gananoque	590 00	4,744 84	264 81	5,599 65
29	Goderich	571 00	4,659 42	275 00	5,505 42
30	Gore Bay	378 00	1,890 69	385 30	2,653 99
31	Gravenhurst	229 00	3,819 62	11 36	4,059 98
32	Harriston	216 00	2,471 00	206 25	2,893 25
33	Ingersoll	655 00	6,196 80	568 80	7,420 60
34	Kincardine	438 00	4,212 00	519 63	5,169 63
35	Leamington	330 00	3,424 33	30 03	3,784 36
36	Lindsay	770 00	9,223 31	685 03	10,678 34
37	Listowel	310 00	3,290 00	61 50	3,661 50
38	Little Current	167 00	752 00	767 21	1,686 21
39	Mattawa	312 00	842 00	250 33	1,404 33
40	Meaford	380 00	2,640 87	138 17	3,159 04
41	Midland	296 00	3,475 00	223 29	3,994 29
42	Milton	297 00	1,178 52	2,369 94	3,845 46
43	Mitchell	423 00	2,729 00	392 55	3,544 55
44	Mount Forest	441 00	3,319 00	251 55	4,011 55
45	Napanee	534 00	4,770 00	113 11	5,417 11
46	Newmarket	378 00	2,900 00	824 16	4,102 16
47	Niagara	147 00	1,537 15	212 85	1,897 00
48	Niagara Falls	505 00	6,600 00	97 28	7,202 28
49	North Bay	470 00	3,130 26	469 36	4,069 62
50	North Toronto	199 00	3,933 30	224 31	4,356 61
51	Oakville	196 00	475 00	1,689 36	2,360 36
52	Orangeville	607 00	4,050 00	174 94	4,831 94
53	Orillia	494 00	7,500 00	37 75	8,031 75
54	Oshawa	456 00	6,283 00	48 10	6,787 10
55	Owen Sound	1,047 00	10,750 13	472 28	12,269 41
56	Palmerston	247 00	3,062 95	70 60	3,380 55
57	Parkhill	145 00	2,163 00	665 85	2,973 85
58	Paris	343 00	4,680 56	2,151 56	7,175 12
59	Parry Sound	568 00	4,385 50	207 78	5,161 28
60	Pembroke	349 00	4,566 04	415 46	5,330 50
61	Pentanguishene	302 00	1,241 48	232 49	1,775 97

Public Schools.

Expenditure.

	Teachers' salaries.	Sites and building school houses.	Maps, apparatus, prizes and libraries.	Rent and repairs, fuel and other expenses.	Total expenditure for all Public School purposes.	Balances.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1	1,596 82		44 45	384 94	2,026 21	276 70
2	3,614 38			1,144 14	4,758 52	
3	1,858 68	200 00	31 25	241 46	2,331 39	404 47
4	2,876 23		58 43	1,099 99	4,034 65	290 68
5	1,999 92		7 60	376 06	2,383 58	748 73
6	3,107 50	723 17	11 54	604 90	4,447 11	288 43
7	7,751 50	181 65	218 37	2,008 27	10,159 79	258 64
8	9,900 10	273 27	901 34	4,206 49	15,281 20	
9	2,655 35		30 25	706 79	3,392 39	294 10
10	1,384 66			429 12	1,813 78	369 84
11	4,685 98			856 16	5,542 14	47 81
12	2,439 39	919 87	19 25	747 04	4,125 55	127 40
13	4,018 75			1,041 90	5,060 65	112 34
14	8,819 28	600 00		4,460 85	13,880 13	471 27
15	4,370 52	58 93		1,158 39	5,587 84	1,905 28
16	3,025 00			947 10	3,974 10	160 93
17	4,342 50	471 37	41 98	940 17	5,796 02	
18	6,605 17	1,397 25	181 86	2,351 69	10,535 97	682 86
19	4,167 50		42 79	1,152 50	5,362 79	2,683 83
20	4,134 93	232 24	101 20	776 51	5,244 88	973 67
21	2,663 10			681 66	3,344 76	4,174 91
22	3,711 41		9 00	1,387 53	5,107 94	518 45
23	2,303 13	331 65	42 72	238 35	2,915 85	191 14
24	2,007 00		12 05	309 65	2,328 70	24 75
25	2,331 00			701 41	3,032 41	273 71
26	4,379 16	1,236 00	50 55	1,702 26	7,367 97	36
27	10,551 99		124 45	2,322 41	12,998 85	158 70
28	4,960 00		25 15	530 85	5,516 00	83 65
29	4,478 80		44 93	981 69	5,505 42	
30	1,316 25	174 10	76 40	357 20	1,923 95	730 04
31	2,854 94	140 07		1,057 64	4,052 65	7 33
32	2,095 00	106 32	21 80	475 99	2,699 11	194 14
33	5,423 66		57 80	1,926 46	7,407 92	12 68
34	3,402 90			804 33	4,207 23	962 40
35	2,927 75	101 50		596 14	3,625 39	158 97
36	7,992 15			2,684 73	10,676 88	1 46
37	3,059 82			601 68	3,661 50	
38	1,000 00			244 59	1,244 59	441 62
39	1,150 00		26 96	204 19	1,381 15	23 18
40	2,610 05			500 33	3,110 38	48 66
41	2,951 71			785 65	3,737 36	256 93
42	2,345 00	368 30	22 25	388 32	3,123 87	721 59
43	3,095 57			222 95	3,318 52	226 03
44	3,049 50			884 40	3,933 90	77 65
45	3,541 48			1,489 86	5,031 34	385 77
46	2,413 25		64 01	901 27	3,378 53	723 63
47	1,575 00			235 26	1,810 26	86 74
48	4,821 00		122 75	2,106 27	7,050 02	152 26
49	2,371 83	526 84	20 00	1,034 91	3,953 58	116 04
50	2,998 29	91 51	41 20	1,029 26	4,160 26	196 35
51	1,865 00	1 20		494 11	2,360 36	
52	3,931 05		95 99	804 90	4,831 94	
53	6,486 19	70 00	106 13	1,241 55	7,903 87	127 88
54	4,747 14		17 40	2,022 14	6,786 68	42
55	9,827 50			2,287 06	12,114 56	154 85
56	2,540 00			757 84	3,297 84	82 71
57	1,626 00		67 95	524 98	2,218 93	754 92
58	3,659 05	26 25		1,424 93	5,110 23	2,064 89
59	3,702 99		100 80	1,252 14	5,055 93	105 35
60	3,948 68	151 32	28 95	625 73	4,754 68	575 82
61	1,090 00			257 46	1,347 46	428 51

V.—TABLE E.—The

Towns.	Receipts. Legislative grants.	Municipal grants and assessments.	Clergy reserve fund, balances and other sources.	Total receipts for all Public School purposes.
	$ c.	$ c.	$ c.	$ c.
62 Perth	504 00	3,957 85	275 94	4,737 79
63 Peterborough	1,176 00	16,700 00	1,379 05	19,255 05
64 Petrolea	565 00	10,000 00	2,382 21	12,947 21
65 Picton	564 00	4,000 00	421 65	4,985 65
66 Port Arthur	273 00	2,965 84	22 15	3,260 99
67 Port Hope	711 00	6,305 98	257 10	7,274 08
68 Prescott	408 00	2,643 00	315 47	3,366 47
69 Rat Portage	499 00	19,900 00	31,250 29	51,649 29
70 Renfrew	363 00	2,136 01	3,613 91	6,112 92
71 Ridgetown	278 00	3,185 00	142 36	3,605 36
72 Sandwich	168 00	2,000 00	2,015 40	4,183 40
73 Sarnia	845 00	9,323 80	751 33	10,920 13
74 Sault Ste. Marie	656 00	4,950 00	355 67	5,961 67
75 Seaforth	297 00	3,050 00	747 40	4,094 40
76 Simcoe	499 00	4,121 13	77 25	4,697 38
77 Smith's Falls	529 00	6,230 52	562 70	7,322 22
78 Stayner	158 00	1,900 00	241 92	2,299 92
79 Sturgeon Falls	41 00	693 44	107 37	841 81
80 St. Mary's	425 00	4,430 62	788 52	5,644 14
81 Strathroy	528 00	4,350 00	71 97	4,949 97
82 Sudbury	145 00	1,472 41	202 72	1,820 13
83 Thessalon	278 00	1,609 61	48 64	1,936 25
84 Thornbury	91 00	1,681 38	233 76	2,006 14
85 Thorold	196 00	3,055 17	32 40	3,283 57
86 Tilsonburg	300 00	3,509 49	88 43	3,897 92
87 Toronto Junction	896 00	15,118 05	621 50	16,635 55
88 Trenton	400 00	3,215 24	235 01	3,850 25
89 Uxbridge	229 00	2,805 00	33 81	3,067 81
90 Vankleekhill	316 00	2,050 00	898 59	3,264 59
91 Walkerton	447 00	4,059 95	151 89	4,658 84
92 Walkerville	187 00	3,000 00	348 61	3,535 61
93 Wallaceburg	309 00	4,797 32	102 99	5,209 31
94 Waterloo	399 00	5,000 00	192 78	5,591 78
95 Welland	376 00	3,277 35	2,591 64	6,244 99
96 Whitby	432 00	4,250 00	59 50	4,741 50
97 Wiarton	260 00	2,521 98	663 92	3,445 90
98 Wingham	263 00	3,460 00	268 34	3,991 34
99 Woodstock	1,243 00	12,400 00	6,779 01	20,422 01
Total	42,011 00	457,359 91	94,811 36	594,182 27
Totals.				
1 Counties, etc	245,268 78	1,889,762 01	931,573 42	3,066,604 21
2 Cities	53,191 00	958,259 82	158,022 46	1,169,473 28
3 Towns	42,011 00	457,359 91	94,811 36	594,182 27
4 Grand total, 1898	340,470 78	3,305,381 74	1,184,407 24	4,830,259 76
5 " 1897	339,863 30	3,136,943 99	1,176,023 72	4,652,831 01
6 Increase	607 48	168,437 75	8,383 52	177,428 75
7 Decrease				
8 Percentage	7	68	25	
Cost per pupil.				
1 Counties, etc	$ 7 69			
2 Cities	16 61			
3 Towns	8 95			
4 Province	9 26			

Public Schools.

Expenditure.

	Teachers' salaries.	Sites and building school houses.	Maps, apparatus, prizes and libraries.	Rent and repairs, fuel and other expenses.	Total expenditure for all Public School purposes.	Balances.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
62	3,639 00	.....	.....	891 03	4,530 03	207 76
63	13,387 94	.....	.....	5,759 56	19,147 50	107 55
64	6,230 50	3,839 70	.....	1,660 55	11,720 75	1,216 46
65	3,744 73	.....	68 80	623 12	4,436 65	549 00
66	2,077 47	.....	.....	1,167 97	3,245 44	15 55
67	5,717 64	.....	.....	1,556 44	7,274 08	.....
68	2,720 00	.....	.....	605 37	3,325 37	41 10
69	7,397 90	22,047 89	535 83	20.875 47	50,857 09	792 29
70	3,047 13	2,313 33	14 68	466 20	5,841 34	271 58
71	2,780 38	3 15	103 29	542 37	3,429 19	176 17
72	1,818 50	.....	.....	224 14	2,042 64	2,140 76
73	7,789 70	.....	.....	2,039 56	9,829 26	1,090 87
74	3,773 05	351 24	214 72	1,526 89	5,865 90	95 77
75	2,611 25	.....	29 05	656 55	3,296 85	797 55
76	4,089 00	.....	108 85	297 92	4,495 77	201 61
77	4,680 75	.....	59 30	2,581 92	7,321 97	25
78	1,755 08	.....	23 00	283 61	2,061 69	238 23
79	550 00	.....	.....	210 93	760 93	80 88
80	3,052 21	55 00	.....	2,180 09	5,287 30	356 84
81	3,940 86	.....	79 81	928 54	4,949 21	76
82	1,130 00	212 00	.....	468 40	1,810 40	9 73
83	1,365 56	.....	94 88	326 37	1,786 81	149 44
84	1,485 00	.....	.....	213 92	1,698 92	307 22
85	2,450 00	.....	.....	443 78	2,893 78	389 79
86	3,061 25	.....	84 31	637 50	3,783 06	114 86
87	12,048 57	31 00	63 00	4,141 71	16,284 28	351 27
88	2,610 08	.....	20 00	1,072 33	3,702 41	147 84
89	2,321 48	.....	.....	742 83	3,064 31	3 50
90	1,932 97	.....	160 92	1,000 49	3,094 38	170 21
91	3,599 87	102 40	11 75	748 35	4,462 37	196 47
92	2,433 32	.....	30 17	1,056 36	3,519 85	15 76
93	3,697 18	575 00	49 25	887 88	5,209 31	.....
94	4,212 85	.....	131 17	1,151 10	5,495 12	96 66
95	2,624 86	.....	.....	981 89	3,606 75	2,638 24
96	3,820 00	.....	.....	912 14	4,732 14	9 36
97	2,300 00	.....	.....	610 13	2,910 13	535 77
98	3,152 05	.....	.....	839 29	3,991 34	.....
99	11,032 00	.....	.....	4,447 00	15,479 00	4,943 01
	377,238 63	37,913 57	4,752 33	130,476 25	550,380 78	43,801 49
1	1,723,387 24	183,770 12	40,276 35	416,300 74	2,363,734 45	702,869 76
2	646,534 11	204,738 28	12,671 10	265,175 17	1,129,118 66	40,354 62
3	377,238 63	37,913 57	4,752 33	130,476 25	550,380 78	43,801 49
4	2,747,159 98	426,421 97	57,699 78	811,952 16	4,043,233 89	787,025 87
5	2,717,261 09	350,456 70	54,798 27	790,985 42	3,913,501 48	739,329 53
6	29,898 89	75,965 27	2,901 51	20,966 74	129,732 41	47,696 34
7	.....	.....	.....	.....	.....	.....
8	68	11	1	20	.....	.....

VI.—TABLE F.—The Roman

Counties. Including incorporated villages, but not cities or towns.)	No. of schools.	Receipts. Legislative grants.	School rate on supporters.	Subscribed and from other sources.	Total amount received.	Expendi- Teachers' salaries.	Sites and building school houses.	Maps, apparatus, prizes and libraries,
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1 Bruce	11	474 00	4,177 34	2,182 47	6,833 81	3,570 00	1,324 92	163 85
2 Carleton	14	756 00	5,887 38	1,383 31	8,026 69	4,080 96	1,201 69	44 21
3 Essex	8	580 00	3,104 64	526 71	4,211 35	2,628 65	252 42	70 00
4 Frontenac	10	404 00	2,505 63	1,072 52	3,982 15	2,445 00	49 00	174 13
5 Grey	7	262 00	1,617 81	481 19	2,361 00	1,534 73	87 47	11 77
6 Hastings	7	317 00	1,844 01	635 71	2,796 72	1,636 27	324 95	12 05
7 Huron	6	178 00	2,082 78	586 80	2,847 58	2,003 03	78 98	19 50
8 Kent	5	148 00	2,097 28	574 26	2,819 54	1,785 00	4 38	.....
9 Lambton	2	44 00	395 38	316 86	756 24	475 00	....	.....
10 Lanark	3	138 00	539 17	384 58	1,061 75	615 00	4 55	14 08
11 Leeds and Grenville	5	326 25	1,476 02	385 98	2,188 25	1,137 35	289 41	.....
12 Lennox and Addington	2	53 00	311 28	304 55	668 83	420 63	8 56	23 23
13 Lincoln	1	69 00	723 49	663 39	1,455 88	750 00	376 00	8 40
14 Middlesex	4	107 00	964 01	283 27	1,354 28	925 00	....	.....
15 Norfolk	1	55 00	534 98	475 79	1,065 77	450 00	....	13 71
16 Northumberland	7	211 00	1,882 76	405 52	2,499 28	1,450 00	282 77	.....
17 Ontario	1	102 00	228 40	762 81	1,093 21	625 00	2 53	10 00
18 Peel	1	41 00	143 88	43 43	228 31	210 00	....	.. ..
19 Perth	4	108 10	1,155 34	233 24	1,496 68	1,085 00	.....	... .
20 Peterborough	1	21 00	265 48	28 41	314 89	230 00	... .	9 50
21 Prescott and Russell	63	3,117 50	21,234 15	7,930 64	32,282 29	17,664 56	4,789 19	599 15
22 Renfrew	9	527 00	2,404 48	2,195 00	5,126 48	2,153 00	1,522 15	37 88
23 Simcoe	3	282 00	1,238 46	176 36	1,696 82	1,135 00	254 00	4 50
24 Stormont, Dundas and Glengarry	12	837 00	5,405 09	2,467 91	8,710 00	4,051 50	1,945 41	20 78
25 Waterloo	8	353 00	4,006 78	5,328 84	9,688 62	2,950 00	4,393 95	57 25
26 Welland	1	21 00	506 18	346 03	873 21	539 08	.....	21 80
27 Wellington	8	315 00	2,847 38	939 78	4,102 16	2,425 00	361 34	9 54
28 Wentworth	1	63 00	135 00	89 00	287 00	200 00	4 00	.....
29 York	2	50 00	437 80	203 45	691 25	365 00	72 20	7 58
30 District Algoma	1	100 00	325 50	2,679 10	3,104 60	300 00	2,552 78	.....
31 " Nipissing	11	880 00	2,848 89	5,084 81	8,813 70	2,780 00	4,142 48	141 65
Total	219	10,939 85	73,326 77	39,171 72	123,438 34	62,619 76	24,325 13	1,474 56
Cities.								
1 Belleville	3	249 00	1,597 57	255 09	2,101 66	1,600 00	27 80	.....
2 Brantford	2	223 00	1,494 86	398 22	2,116 08	1,235 17	440 32	.....
3 Chatham	1	165 00	1,388 15	671 26	2,224 41	1,625 00	....	62 37
4 Guelph	3	272 00	2,647 02	278 33	3,197 35	1,700 00	567 22	106 12
5 Hamilton	8	979 00	11,000 00	2,341 44	14,320 44	5,091 00	3,002 69	725 48
6 Kingston	4	468 00	3,126 00	3,500 00	7,094 00	4,075 00	.....	.....
7 London	6	600 00	6,060 77	100 87	6,761 64	2,600 00	2,250 00	250 00
8 Ottawa	20	4,127 00	33,000 00	1,905 24	39,032 24	20,665 00	912 85	460 00
9 St. Catharines	3	236 00	4,142 57	215 58	4,594 15	1,900 00	1,477 50	6 75
10 St. Thomas	1	125 00	1,199 13	70 00	1,394 13	800 00	..	121 20
11 Stratford	1	231 00	2,492 75	819 24	3,542 99	1,300 00	1,193 24	60 37
12 Toronto	21	2,874 00	37,813 84	56,945 92	97,633 76	20,338 88	56,269 09	1,219 61
Total	73	10,549 00	105,962 66	67,501 19	184,012 85	62,930 05	66,140 71	3,011 90

Catholic Separate Schools.

	sure.						Pupils.			Attendance.							
	All other purposes.		Total amount expended.		Balances.		Number of pupils.	Boys.	Girls.	Average attendance.	Percentage of average to total attendance.	Less than 20 days during the year.	21 to 50 days.	51 to 100 days.	101 to 150 days.	151 to 200 days.	201 days to whole year.
	$	c.	$	c.	$	c.											
1	776	21	5,834	98	998	83	875	471	404	574	66	35	75	124	179	372	90
2	1,896	29	7,223	15	803	54	1,282	625	657	664	52	109	230	308	232	376	27
3	931	70	3,882	77	328	58	590	294	296	361	62	25	40	131	138	196	60
4	449	10	3,117	23	864	92	364	187	177	201	55	21	37	66	81	144	15
5	249	30	1,883	27	477	73	293	158	135	130	44	27	60	62	68	76	....
6	317	27	2,290	54	506	18	277	149	128	128	47	29	35	59	71	76	7
7	477	27	2,578	78	268	80	398	224	174	222	56	14	49	92	104	129	10
8	480	87	2,270	25	549	29	360	187	173	203	57	20	47	77	77	117	22
9	83	03	558	03	198	21	100	59	41	50	50	8	14	25	21	32	...
10	217	91	851	54	210	21	109	51	58	59	54	8	16	19	36	28	2
11	329	43	1,756	19	432	06	229	108	121	127	56	12	38	46	54	52	27
12	174	12	626	54	42	29	90	44	46	45	50	8	18	13	11	38	2
13	148	99	1,283	39	172	49	153	81	72	89	..	14	19	25	40	54	1
14	214	83	1,139	83	214	45	117	71	46	63	54	4	14	20	27	39	13
15	98	84	562	55	503	22	98	56	42	51	52	....	17	20	33	27	1
16	481	18	2,213	95	285	33	233	122	111	126	54	13	23	48	50	94	5
17	309	38	946	91	146	30	100	54	46	73	73	.....	5	13	15	46	21
18	18	00	228	00		31	29	15	14	14	49	.....	3	9	7	10	.. .
19	169	80	1,254	80	241	88	225	121	104	107	48	19	38	46	55	55	12
20	49	06	288	56	26	33	34	16	18	16	48	1	8	8	12	5	....
21	3,584	45	26,637	35	5,644	94	5,439	2,805	2,634	2,906	54	429	814	1,155	1,305	1,552	184
22	764	44	4,477	47	649	01	569	289	270	247	49	43	100	107	108	146	5
23	149	44	1,542	94	153	88	241	139	102	141	59	16	24	42	38	101	20
24	2,139	71	8,157	40	552	60	1,294	615	679	591	46	134	220	397	266	249	28
25	843	72	8,244	92	1,443	70	720	384	336	403	56	42	104	140	147	253	34
26	134	22	695	10	178	11	50	25	25	31	62	3	6	8	9	24	....
27	583	21	3,379	09	723	07	502	262	240	288	58	22	58	103	120	184	15
28	33	00	237	00	50	00	28	17	11	15	54	1	2	9	8	6	2
29	130	09	574	87	116	38	106	42	64	59	56	5	19	18	25	39	....
30	180	64	3,033	42	71	18	71	39	32	37	52	5	14	11	12	29	....
31	1,677	93	8,742	06	71	64	587	280	307	327	56	60	104	158	138	119	8
	18,093	43	106,512	88	16,925	46	15,503	7,940	7,563	8,348	55	1,127	2,251	3,359	3,487	4,668	611
1	439	20	2,067	00	34	66	541	321	220	254	47	16	68	201	184	72	....
2	427	44	2,102	93	13	15	313	140	173	237	75	.....	4	50	63	196	....
3	494	55	2,181	92	42	49	337	183	154	196	58	34	66	62	145	30	....
4	668	84	3,042	18	155	17	431	235	196	313	71	2	15	49	141	224	....
5	4,250	50	13,069	67	1,250	77	1,683	800	883	1,142	68	23	74	310	238	1,038	....
6	1,191	50	6,066	50	1,027	50	817	403	414	582	72	17	46	121	154	479	....
7	1,327	14	6,427	14	334	50	769	405	364	597	78	.....	30	91	197	451	....
8	16,148	24	38,186	09	846	15	5,645	2,939	2,706	3,582	64	371	544	1,022	1,278	2,396	34
9	1,183	77	4,568	02	26	13	368	201	167	234	63	7	27	77	67	190	....
10	256	00	1,177	20	216	93	195	102	93	172	88	....	1	13	13	156	12
11	435	10	2,988	71	554	28	310	177	133	245	80	4	11	44	63	188	....
12	11,888	89	89,716	47	7,917	29	4,919	2,507	2,412	3,342	68	203	404	805	906	2,603	....
	39,511	17	171,593	83	12,419	02	16,328	8,413	7,915	10,896	67	677	1,290	2,843	3,449	8,023	46

VI.—TABLE F.—The Roman

Towns.	No. of schools.	Receipts.				Expendi-		
		Legislative grants.	School rate on supporters.	Subscribed and from other sources.	Total amount received.	Teachers' salaries.	Sites and building school houses.	Maps, apparatus, prizes and libraries.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1 Almonte	1	104 00	2,204 48	463 90	2,772 38	808 10	180 28	12 19
2 Amherstburg	2	135 00	1,704 25	1,290 92	3,130 17	1,288 84	54 15	25 10
3 Arnprior	2	177 00	1,780 68	754 01	2,711 69	1,316 58	144 00	.... ..
4 Barrie	1	139 00	1,425 18	901 30	2,465 48	900 00	320 94	16 12
5 Berlin	1	220 00	2,168 90	7,357 81	9,746 71	1,400 00	7,301 52	14 00
6 Brockville	1	251 00	2,456 25	18 79	2,726 04	2,490 00	61 31	6 00
7 Cobourg	1	128 00	900 77	.... .	1,028 77	800 00	.....	12 00
8 Cornwall	3	444 00	4,412 00	26 90	4,882 90	3,430 00	.....	... .
9 Dundas	1	122 00	865 10	76 85	1,063 95	600 00	.....	.....
10 Galt	1	58 00	459 54	207 36	724 90	325 00	281 47	1 42
11 Goderich	1	44 00	458 00	43 10	545 10	400 00	....	.....
12 Ingersoll	1	76 00	682 24	10 00	768 24	575 00	11 45	6 80
13 Lindsay	2	214 00	2,097 38	1,993 75	4,305 13	2,025 00	....	384 63
14 Mattawa	1	149 00	3,041 01	299 25	3,489 26	1,653 61	1,030 89	144 41
15 Newmarket	1	34 00	250 61	203 17	487 78	265 00	6 00	.....
16 Niagara Falls	1	116 00	947 69	154 86	1,218 55	600 00	....	40 00
17 North Bay	2	90 00	650 00	964 40	1,704 40	1,019 91	263 55	.....
18 Oakville	1	23 00	187 47	138 93	349 40	300 00	... .	.....
19 Orillia	1	110 00	1,861 95	1,441 51	3,413 46	1,350 00	48 00	.....
20 Oshawa	1	47 00	500 00	.....	547 00	426 40	.....	4 25
21 Owen Sound	1	67 00	666 32	594 27	1,327 59	385 00	348 80	6 75
22 Paris	1	29 00	449 47	439 53	918 00	360 00	....	12 50
23 Parkhill	1	30 00	302 26	100 00	432 26	401 67	....	.....
24 Pembroke	1	266 00	2,875 52	140 38	3,281 90	2,516 00	312 12	.....
25 Perth	1	101 00	810 00	90 35	1,001 35	600 00	155 54	.....
26 Peterborough	3	402 00	4,037 61	1,458 89	5,898 50	3,578 25	29 10	25 00
27 Picton	1	31 00	602 57	271 31	904 88	400 00	.....	.....
28 Port Arthur	1	99 00	709 46	374 26	1,182 72	800 00	87 64	.....
29 Prescott	1	127 00	1,054 95	498 37	1,680 32	1,100 00	.. ..	.. ....
30 Rat Portage	2	81 00	1,311 90	1,073 56	2,466 46	1,000 00	1,100 00	.....
31 Renfrew	2	165 00	1,294 17	152 16	1,611 33	1,018 04	.....	.....
32 Sarnia	1	80 00	1,008 00	270 65	1,358 65	900 00	14 70	30 50
33 Sault Ste. Marie	1	57 00	629 99	501 06	1,188 05	670 00	75 00	58 40
34 St. Mary's	1	41 00	378 55	306 75	726 30	325 00	.....	10 15
35 Sturgeon Falls	1	94 00	647 34	67 45	808 79	529 00	139 00	.. ...
36 Sudbury	1	93 00	574 75	536 90	1,204 65	750 00	11 50	185 45
37 Thorold	1	77 00	841 43	66 82	985 25	700 00	45 11	20 00
38 Trenton	1	168 00	2,117 74	176 43	2,462 17	1,250 00	459 04	.....
39 Vankleekhill	1	134 00	937 57	134 17	1,205 74	800 00	....	.....
40 Walkerton	1	91 00	648 30	98 05	837 35	600 00	9 25	45 00
41 Wallaceburg	1	48 00	882 35	211 28	1,141 63	800 00	....	20 24
42 Waterloo	1	54 00	600 00	44 04	698 04	400 00	129 72	31 00
43 Whitby	1	34 00	246 68	49 75	330 43	265 05	... .	.....
Total	53	5,050 00	52,680 43	24,003 24	81,733 67	42,121 40	12,620 08	1,111 91
Totals.								
1 Counties, etc	219	10,939 85	73,326 77	39,171 72	123,438 34	62,619 76	24,325 13	1,474 56
2 Cities	73	10,549 00	105,962 66	67,501 19	184,012 85	62,930 05	66,140 71	3,011 90
3 Towns	53	5,050 00	52,680 43	24,003 24	81,733 67	42,121 40	12,620 08	1,111 91
4 Grand total, 1898	345	26,538 85	231,969 86	130,676 15	389,184 86	167,671 21	103,085 92	5,598 37
5 " " 1897	340	26,675 25	224,617 33	84,031 39	335,323 97	168,799 52	41,233 23	5,786 54
6 Increase	5	.....	7,352 53	46,644 76	53,860 89	.....	61,852 69	....
7 Decrease	....	136 40	.. ..	....	.....	1,128 31	....	188 17
8 Percentage	....	8	59	33	.....	47	29	2
Cost per pupil :—								
1 Counties	....	7 16						
2 Cities	....	10 51						
3 Towns	....	7 25						
4 Province	....	8 49						

Catholic Separate Schools.

	ture.			Pupils.			Attendance.							
	All other purposes.	Total amount expended.	Balances.	Number of pupils	Boys.	Girls.	Average attendance.	p. c. of average to total attendance.	Less than 20 days during the year.	21 to 50 days.	51 to 100 days.	101 to 150 days.	151 to 200 days.	201 days to whole year.
	$ c.	$ c.	$ c.											
1	580 17	1,580 74	1,191 64	169	92	77	105	63	2	18	32	45	72	....
2	1,598 51	2,966 60	163 57	275	123	152	189	69	4	21	40	51	159	....
3	1,251 11	2,711 69	....	391	188	203	238	61	14	46	80	93	158	....
4	760 40	1,997 46	468 02	205	99	106	148	72	7	14	21	31	132	....
5	551 21	9,266 73	479 98	364	196	168	266	74	4	18	56	64	222	....
6	.....	2,557 31	168 73	387	170	217	302	79	7	10	25	88	257	....
7	190 23	1,002 23	26 54	226	119	107	153	68	3	5	37	72	109	....
8	1,236 55	4,666 55	216 35	975	475	500	602	62	52	134	214	172	403	....
9	148 58	748 58	315 37	220	136	84	149	68	11	16	31	28	134	....
10	68 78	676 67	48 23	92	55	37	69	75	2	8	6	12	63	1
11	105 76	505 76	39 34	74	35	39	64	86	.....	.....	1	12	60	1
12	174 99	768 24	.....	109	48	61	78	72	.....	4	13	31	60	1
13	365 22	2,774 85	1,530 28	383	160	223	262	69	18	17	62	83	203	....
14	564 05	3,392 96	96 30	284	152	132	164	58	9	25	75	60	115	....
15	65 63	336 63	151 15	72	36	36	45	63	7	8	5	17	35	....
16	360 20	1,000 20	218 35	162	79	83	118	73	2	19	18	29	94	....
17	261 85	1,545 31	159 09	221	113	108	152	69	3	26	39	40	113	....
18	41 00	341 00	8 40	37	23	14	20	55	4	5	9	6	13	....
19	591 65	1,989 65	1,423 81	222	116	106	163	73	1	13	28	46	129	5
20	91 15	521 80	25 20	78	35	43	59	76	3	5	11	13	46	....
21	122 89	863 44	464 15	105	56	49	76	72	1	6	19	12	67	....
22	101 66	474 16	443 84	61	28	33	43	71	.....	2	14	12	33	....
23	25 95	427 62	4 64	64	28	36	43	68	4	5	9	12	34	....
24	363 08	3,191 20	90 70	593	346	247	341	58	14	34	114	148	283	....
25	205 59	961 13	40 22	238	126	112	155	65	6	22	51	42	112	5
26	1,285 66	4,918 01	980 49	758	381	377	553	73	13	74	75	143	437	16
27	97 42	497 42	407 46	41	26	15	29	70	2	2	2	12	23	....
28	217 98	1,105 62	77 10	156	69	87	113	72	.....	10	31	27	88	....
29	580 32	1,680 32	.. ...	208	110	98	125	60	7	11	30	32	128	....
30	151 35	2,251 35	215 11	290	140	150	161	56	10	40	72	68	100	....
31	593 29	1,611 33	... ...	374	180	194	221	59	23	29	98	116	108	....
32	222 50	1,167 70	190 95	180	88	92	115	64	1	8	33	29	101	8
33	384 65	1,188 05	.....	157	85	72	79	50	6	17	22	30	82	....
34	391 15	726 30	.....	69	33	36	50	73	.....	.....	12	22	35	....
35	134 79	802 79	6 00	188	89	99	95	50	11	30	61	35	51	....
36	205 01	1,151 96	52 69	224	109	115	111	50	34	30	41	51	68	....
37	217 32	982 43	2 82	130	51	79	88	68	9	9	9	17	86	....
38	483 00	2,192 04	270 13	252	116	136	192	76	3	8	34	71	136	....
39	176 46	976 46	229 28	255	120	135	137	54	14	31	66	49	95	....
40	161 17	815 42	21 93	205	103	102	140	69	10	20	37	31	107	....
41	221 84	1,042 08	99 55	160	83	77	80	50	9	29	42	38	42	..
42	136 02	696 74	1 30	129	54	75	95	74	6	9	17	32	65	....
43	35 15	300 15	30 28	53	25	28	39	74	2	1	5	41	4	....
	15,521 29	71,374 68	10,358 99	9,836	4,896	4,940	6,427	66	338	839	1,697	2,063	4,862	37
1	18,093 43	106,512 88	16,925 46	15,503	7,940	7,563	8,348	55	1,127	2,251	3,359	3,487	4,668	611
2	39,511 17	171,593 83	12,419 02	16,328	8,413	7,915	10,896	67	677	1,290	2,843	3,449	8,023	46
3	15,521 29	71,374 68	10,358 99	9,836	4,896	4,940	6,427	66	338	839	1,697	2,063	4,862	37
4	73,125 89	349,481 39	39,703 47	41,667	21,249	20,418	25,671	62	2,142	4,380	7,899	8,999	17,553	694
5	86,350 12	302,169 41	33,154 56	41,620	21,342	20,278	24,996	60	2,298	4,549	8,671	8,846	16,678	578
6	.....	47,311 98	6,548 91	47	....	140	675	2	....	.....	....	153	875	116
7	13,224 23	.....	... ...	.....	93	.....	.....	....	156	169	772	.....	.....	....
8	22 00	... ...	.....	.....	5	49	.....	....	5	11	19	21	42	2

VII —TABLE G.—The Roman

Counties. (including incorporated villages, but not cities or towns.)	Teachers.					Number in the					
	Number of teachers.	Male.	Female.	Average salary, male.	Average salary, female.	Reading.	Writing.	Arithmetic.	Drawing.	Geography.	Music.
				$	$						
1 Bruce	17	4	13	364	163	875	875	875	854	584	724
2 Carleton	20	2	18	243	204	1,282	1,282	1,282	1,090	733	393
3 Essex	12	....	12	.....	237	590	590	590	590	352	321
4 Frontenac	10	1	9	245	232	364	364	364	364	299	133
5 Grey	7	....	7	.....	220	293	293	293	293	216	33
6 Hastings	7	....	7	.....	239	277	277	277	275	205	76
7 Huron	7	3	4	285	290	398	393	393	354	301	120
8 Kent	7	1	6	275	252	360	360	360	360	241	283
9 Lambton	2	....	2	.....	237	100	100	100	100	71	.....
10 Lanark	3	....	3	.....	225	109	109	109	94	68	91
11 Leeds and Grenville	6	....	6	.....	186	229	217	206	191	155	90
12 Lennox & Add'gton	2	....	2	.....	213	90	90	90	90	60	58
13 Lincoln	3	1	2	350	200	153	153	153	153	89	131
14 Middlesex	4	1	3	250	225	117	115	115	110	94	29
15 Norfolk	1	....	1	....	450	98	98	98	98	98	98
16 Northumberland	8	....	8	.....	199	233	233	233	221	188	26
17 Ontario	2	1	1	420	225	100	100	100	100	80	.....
18 Peel	1	....	1	....	210	29	29	29	18	18	.....
19 Perth	4	1	3	315	257	225	211	225	169	148	.....
20 Peterborough	1	....	1	....	230	34	34	34	34	28	.....
21 Prescott and Russell	82	14	68	262	214	5,439	5,376	5,363	3,160	2,329	1,321
22 Renfrew	11	1	10	250	200	509	509	494	342	297	224
23 Simcoe	5	1	4	375	190	241	241	241	236	232	.....
24 Stormont, D. & G.	20	1	19	400	218	1,294	1,294	1,294	1,048	703	529
25 Waterloo	13	1	12	300	221	720	720	720	720	483	505
26 Wellington	1	....	1	....	275	50	50	50	50	33	50
27 Wentworth	11	1	10	300	205	502	502	502	502	384	317
28 York	1	....	1	.....	200	28	28	28	28	17	28
29 District Algoma	2	....	2	.....	208	106	106	106	106	29	66
30 " Nipissing	2	....	2	.....	150	71	71	47	39	25	71
	12	2	10	300	194	587	559	536	296	157	71
Total	284	36	248	293	215	15,503	15,384	15,307	12,085	8,717	5,788
Cities.											
1 Belleville	6	1	5	600	200	541	541	541	541	286	.....
2 Brantford	5	....	5	..	220	313	313	313	313	313	.....
3 Chatham	6	1	5	500	225	337	337	337	337	337	337
4 Guelph	8	....	8	.....	213	431	431	431	431	431	431
5 Hamilton	38	...	38	.....	135	1,683	1,683	1,683	1,683	1,683	1,683
6 Kingston	15	3	12	466	223	817	817	817	817	649	540
7 London	16	....	16	....	163	769	769	769	769	769	769
8 Ottawa	86	6	80	663	229	5,645	5,645	5,645	5,051	3,586	3,531
9 St. Catharines	9	1	8	450	181	368	368	368	368	368	338
10 St. Thomas	4	....	4	.....	200	195	195	195	195	195	195
11 Stratford	6	..	6	.....	217	310	310	310	310	310	310
12 Toronto	91	25	66	300	200	4,919	4,919	4,919	4,919	4,919	4,818
Total	290	37	253	390	199	16,328	16,328	16,328	15,734	13,846	12,952

Catholic Separate Schools.

	different branches of instruction.											Maps and prizes.		Arbor Day.
	Grammar and Composition.	English History.	Canadian History.	Temperance and Hygiene.	Drill and Calisthenics.	Bookkeeping.	Algebra.	Geometry.	Botany.	Elementary Physics.	Agriculture.	Number of maps.	No. of schools giving prizes.	No. of trees planted on Arbor Day
1	647	117	302	243	554	48	6	4	....	....	.....	63	5	45
2	529	145	352	499	416	12	7	7	....	....	....	85	5	7
3	274	96	140	155	408	14	14	14	....	2	.....	63	5	10
4	284	132	163	153	247	11	9	9	....	....	.....	61	1	.....
5	155	63	118	173	137	10	10	10	....	....	.....	48	1	17
6	212	83	147	127	200	11	11	11	1	1	1	45	4	7
7	268	106	189	165	130	15	15	15	....	....	.....	57	2	4
8	243	95	112	118	256	25	25	25	....	....	.....	37	2	24
9	69	39	52	50	22	10	10	10	....	....	.....	19	1	.....
10	68	22	34	28	39	.....	.....	.....	....	....	.....	26	.....	6
11	153	73	120	103	110	14	14	14	8	4	.....	43	1	5
12	60	41	41	52	90	1	1	1	....	....	.....	10	.....	....
13	89	73	53	89	153	.....	....	.....	....	....	.....	19	.....	.....
14	74	41	54	51	115	8	8	8	2	2	.....	43	2	3
15	79	18	30	92	98	6	9	6	....	4	.....	4	1	8
16	181	57	79	65	65	8	8	8	....	....	.....	45	1	....
17	80	35	54	54	54	10	10	10	2	10	.....	8	1	.....
18	15	4	9	4	.....	.....	.....	.....	....	....	.....	9	.....	.....
19	149	56	85	70	60	5	5	5	13	13	.....	36	....	2
20	23	3	3	5	.....	1	1	....	....	....	....	7	1	5
21	2.060	223	1,495	1,564	2,041	48	2	8	....	....	65	325	35	95
22	316	137	165	200	177	40	37	33	2	15	.....	35	3	7
23	215	36	31	43	199	12	12	12	....	....	.....	15	1	36
24	660	212	265	96	315	23	16	16	....	9	.....	84	2	2
25	493	72	257	163	648	2	1	1	....	....	.....	73	3	22
26	43	8	26	26	50	2	2	2	....	....	.....	9	....	....
27	353	153	200	166	317	9	9	9	....	....	.....	70	3	5
28	17	7	11	7	.....	2	2	2	....	....	.....	6	1	.....
29	95	4	4	4	106	.....	.....	....	....	....	.....	8	1	.....
30	25	.....	6	.....	.....	.....	.....	....	....	....	.....	4	.....	.....
	168	42	47	70	236	.....	.....	....	....	....	28	51	.....	6
	8,097	2,193	4,644	4,635	7,243	347	244	240	28	60	94	1,408	82	316
1	181	79	181	181	541	.....	.....	....	....	....	.....	30	1	.....
2	188	104	104	313	313	.....	.....	....	....	....	.....	10	1	.....
3	194	62	120	120	337	.....	.....	....	....	....	.....	10	1	.....
4	281	46	176	176	431	.....	.....	....	....	....	.....	33	1	.....
5	1,683	329	633	1,301	1,683	71	71	71	43	22	.....	106	1	.....
6	649	146	340	340	817	37	30	30	1	9	.....	50	.....	.....
7	769	124	305	769	769	124	.....	.....	....	....	.....	28	1	.....
8	2,247	459	2,486	1,718	2,793	362	121	113	....	....	.....	189	1	.....
9	368	100	174	368	368	.....	.....	....	....	....	.....	29	.....	.....
10	195	62	62	117	195	.....	.....	....	....	....	.....	8	.....	....
11	3 0	73	125	125	310	.....	....	....	....	....	.....	23	.....	.....
12	2,643	729	1,537	4,919	4,117	196	278	278	129	41	.....	372	...	....
	9,708	2,313	6,243	10,447	12,674	790	500	492	173	72	.....	888	7	...

VII.—TABLE G.—The Roman

Towns.	Teachers.					Number in the					
	Number of teachers.	Male.	Female.	Average salary, male.	Average salary, female.	Reading.	Writing.	Arithmetic.	Drawing.	Geography.	Music.
				$	$						
1 Alnonte	3	1	2	425	200	169	169	199	169	120	.....
2 Amherstburg	4	...	4	.	240	275	275	275	275	159	275
3 Arnprior	6	1	5	500	200	391	391	391	391	391	.. ..
4 Barrie	4	....	4	.....	225	205	205	205	205	205	205
5 Berlin	8	....	8	.. ..	200	364	364	364	364	266	266
6 Brockville	8	1	7	675	247	387	387	387	387	254	387
7 Cobourg	4	....	4	.. ...	200	226	226	226	226	226	226
8 Cornwall	14	2	12	490	212	975	975	975	975	335	501
9 Dunbas	4	....	4	.....	200	220	220	220	220	200	200
10 Galt	1	....	1	.....	325	92	92	92	70	54	92
11 Goderich	2	....	2	.....	200	74	74	74	74	60	74
12 Ingersoll	2	....	2	.....	288	109	109	109	109	81	.....
13 Lindsay	7	1	6	550	246	383	383	383	383	383	383
14 Mattawa	5	1	4	650	225	284	284	284	284	284	284
15 Newmarket	1	1	....	265	.....	72	72	72	72	29	.....
16 Niagara Falls	3	...	3	.....	200	162	162	162	162	119	162
17 North Bay	3	....	3	.....	341	221	221	221	221	152	120
18 Oakville	1	....	1	.....	300	37	37	37	37	27	37
19 Orillia	4	....	4	.....	338	222	222	222	222	222	222
20 Oshawa	2	....	2	.....	200	78	78	78	78	68	78
21 Owen Sound	2	.	2	.....	193	105	105	105	105	87	.. ..
22 Paris	2	....	2	.....	180	61	61	61	61	61	61
23 Parkhill	1	....	1	..	340	64	64	64	64	64	64
24 Pembroke	9	1	8	600	236	593	593	593	593	348	.... ..
25 Perth	3	....	3	.....	200	238	238	238	238	123	... .
26 Peterborough	14	1	13	800	234	758	683	683	683	522	683
27 Picton	1	1	...	460	..	41	41	41	41	20	26
28 Port Arthur	3	....	3	.....	300	156	156	156	156	131	156
29 Prescott	4	1	3	500	200	208	208	208	208	137	208
30 Rat Portage	5	....	5	.....	200	290	290	290	128	218	290
31 Renfrew	6	1	5	540	230	374	374	374	374	224	225
32 Sarnia	4	....	4	.....	225	180	180	180	180	180	140
33 Sault Ste. Marie	3	....	3	.....	307	157	157	157	157	86	86
34 St Mary's	1	....	1	.....	325	69	69	69	43	43	.....
35 Sturgeon Falls	2	...	2	.. ..	275	188	188	188	188	100	.....
36 Sudbury	3	....	3	.....	250	224	224	224	224	157	.....
37 Thorold	3	....	3	.....	233	130	130	130	130	95	130
38 Trenton	5	....	5	....	250	252	252	252	252	181	252
39 Vankleekhill	4	....	4	....	200	255	255	255	230	180	255
40 Walkerton	4	....	4	. .	150	205	205	205	205	205	205
41 Wallaceburg	2	1	1	500	300	160	160	160	160	104	160
42 Waterloo	2	....	2	.....	200	129	129	129	129	79	129
43 Whitby	1	....	1	....	265	53	53	53	53	35	... .
Total	170	14	156	528	331	9,836	9,761	9,761	9,526	7,015	6,582
Totals.											
1 Counties, etc	284	36	248	293	215	15,503	15 384	15,307	12.085	8,717	5,788
2 Cities	290	37	253	390	199	16,328	16,328	16,328	15,734	13,846	12,952
3 Towns	170	14	156	528	231	9,836	9,761	9,761	9,526	7,015	6,582
4 Grand total, 1898	744	87	657	372	212	41,667	41,473	41,396	37,345	29 578	25,322
5 " 1897	752	94	658	368	208	41,620	39,724	40,165	36,462	27,471	25,837
6 Increase	....	....	....	4	4	47	1,749	1,231	883	2,107	.....
7 Decrease	8	7	1	.. .	.. ..	.....	.....	.....	.....	.....	515
8 Percentage	....	12	88	...	.. ..	100	99	99	90	71	61

Catholic Separate Schools.

	different branches of instruction.											Maps and prizes.		Arbor Day.
	Grammar and Composition.	English History.	Canadian History.	Temperance and Hygiene.	Drill and Calisthenics.	Bookkeeping.	Algebra.	Geometry.	Botany.	Elementary Physics.	Agriculture.	Number of maps.	No. of schools giving prizes.	No. of trees planted on Arbor Day.
1	120	49	72	49	.....	.....	.....	.....	...	....	....	9	.....	.....
2	159	47	103	47	275	19	19	19	....	....	....	27	.....	.....
3	230	64	64	64	222	.....	.....	.....	.....	.....	.....	8	....	.....
4	161	51	89	51	74	.....	.....	.....	.....	....	....	17	....	.....
5	151	66	151	66	364	.....	...	....	...	....	.....	29	1	.....
6	254	95	178	178	387	.....	...	....	....	....	.....	16	.....	.....
7	226	36	50	50	226	.....	...	....	....	..	.....	12	.....	.....
8	335	87	200	87	501	.....	....	....	....	....	.....	18	....	.....
9	220	35	45	35	220	.....	.....	....	....	..	.....	20	.....	.....
10	52	12	32	32	92	.....	...	....	....	....	.....	6	.....	.....
11	49	33	33	49	74	16	.....	....	....	....	.....	9	1	.....
12	59	14	59	14	109	.....	.....	....	....	....	.....	12	.....	.....
13	283	114	121	119	383	33	33	33	....	33	.....	20	1	.....
14	234	46	76	36	111	8	16	16	....	8	.....	20	1	.....
15	29	6	14	14	72	.....	.....	....	....	....	.....	11	1	.....
16	94	34	68	94	162	.....	....	....	....	....	.....	18	.....	.....
17	152	59	92	16	.....	.....	.....	....	....	....	.....	14	.....	.....
18	27	14	19	27	37	.....	.....	....	....	....	.....	6	1	.....
19	156	110	110	158	222	.....	.....	....	....	....	.....	9	....	.....
20	68	19	31	31	78	.....	.....	....	....	....	.....	4	1	.....
21	87	34	44	44	.....	.....	.....	....	....	....	.....	7	.....	.....
22	61	26	26	26	61	.....	.....	....	....	....	.....	10	.....	.....
23	32	13	13	26	64	.....	....	....	....	....	.....	9	.....	.....
24	348	107	191	107	.....	.....	.....	....	....	....	.....	15	1	.....
25	123	53	99	123	.....	.....	.....	....	....	....	.....	7	.....	.....
26	484	142	243	344	399	.....	.....	....	....	....	.....	52	.....	.....
27	20	13	20	13	.....	.....	....	....	....	....	.....	7	.....	.....
28	131	58	58	37	156	.....	....	....	....	...	.....	16	.....	.....
29	157	35	96	96	206	.....	.....	....	....	....	.....	14	.....	20
30	128	68	68	28	62	20	2	....	2	....	.....	10	.....	.....
31	328	143	166	62	173	9	21	21	2	12	.....	26	.....	.....
32	134	49	29	67	102	.....	4	....	....	....	.	17	....	.....
33	26	7	7	.....	.....	.....	.....	....	....	....	.....	8	1	.....
34	33	22	33	22	.....	.....	.....	....	....	....	.....	10	.....	.....
35	152	.....	28	28	100	.....	.....	....	....	....	....	.....	.....	.....
36	157	12	42	12	157	4	3	3	....	....	.....	6	.....	.....
37	130	36	59	59	130	.....	.....	....	....	....	.....	7	.....	.....
38	181	39	78	252	.....	.....	.....	....	....	....	.....	15	.....	.....
39	111	28	53	28	242	.....	....	....	....	....	.....	13	...	.....
40	205	40	77	205	205	.....	...	....	.	....	.....	21	1	.....
41	67	42	67	42	67	20	20	20	....	....	.....	14	1	.....
42	44	22	44	22	129	.....	.....	....	....	....	.....	12	1	.....
43	35	22	22	22	.....	.....	.....	....	....	....	.....	11	.....	.....
	6,333	2,002	3,170	2,882	5,862	129	118	112	4	53	....	592	12	20
1	8,097	2,193	4,644	4,635	7,243	347	244	240	28	60	94	1,408	82	316
2	9,708	2,313	6,243	10,447	12,674	790	500	492	173	72	.....	888	7	.....
3	6,333	2,002	3,170	2,882	5,862	129	118	112	4	53	....	592	12	20
4	24,138	6,508	14,057	17,964	25,779	1,266	862	844	205	185	94	2,888	101	336
5	26,071	6,828	13,134	18,127	29,148	1,298	793	785	154	283	35	2,877	108	342
6	.....	...	923	.....	.....	.....	69	59	51	.....	59	11	.....	.....
7	1,933	320	.....	163	3,369	32	.....	....	....	98	....	....	7	6
8	58	16	34	43	62	3	2	2	½	....	.....	7	.....	1

VIII.—TABLE H.—

Collegiate Institutes.	Receipts.					
	Legislative grants.	Municipal grants (County).	Municipal grants (local).	Fees.	Balances and other sources.	Total receipts.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1 Aylmer	954 08	1,327 58	1,450 00	849 00	311 50	4,892 16
2 Barrie	1,053 22	1,032 22	1,900 00	1,599 50	1,484 24	7,069 18
3 Brantford	1,259 04	...	9 000 00	2,276 42	324 92	12,860 38
4 Brockville	1,147 47	1,277 00	6,300 00	.....	1,694 80	10,419 27
5 Chatham	1,252 28	1,258 90	5,025 00	986 25	944 78	9,467 21
6 Clinton	957 24	1,486 56	1.500 00	1,007 25	1.282 94	6,233 99
7 Cobourg	944 37	9 4 3	2,000 00	1,079 00	6 965 10	11,912 81
8 Collingwood	978 98	978 98	2,200 00	1,077 00	433 65	5,668 61
9 Galt	1,192 45	1,192 45	2,700 00	1,974 50	1,613 50	8,672 90
10 Goderich	1,045 41	1,466 82	2,500 00	1,074 00	1,520 01	7,606 24
11 Guelph	1,134 63	.....	5,382 00	765 50	514 77	7,796 90
12 Hamilton	1,355 65	.....	24,834 88	5,496 75	3,491 66	35,178 94
13 Ingersoll	968 86	915 86	3,041 91	710 75	346 88	5,984 26
14 Kingston	1,246 97	.....	6,500 00	3,923 50	433 94	12.104 41
15 Lindsay	1,239 66	2,587 62	2,834 36	1,634 25	591 23	8,887 12
16 London	1,384 67	2,400 00	24,654 79	1,005 00	9,770 55	39,215 01
17 Morrisburg	1,090 48	2,521 15	2,199 84	1,003 50	1,955 93	8.770 90
18 Napanee	1,121 08	2,000 00	2,610 00	191 25	940 68	6 863 01
19 Niagara Falls	1,034 04	1,237 25	3,700 00	.....	773 17	6,744 46
20 Ottawa	1,291 88	.....	9,787 50	7,072 50	3,242 39	21,394 27
21 Owen Sound	1,204 38	2,496 04	4,800 00	2,358 00	135 97	10,994 39
22 Perth	968 93	3,448 00	1,097 86	402 00	221 76	6,138 55
23 Peterborough	1,242 75	.....	7, 00 00	2,151 75	90 00	10,804 50
24 Ridgetown	960 24	1,903 30	2. 00 00	1,069 00	44 85	6,477 39
25 Sarnia	1,072 24	1,962 68	4,774 00	124 00	418 18	8.351 10
26 Seaforth	967 59	1,741 03	1 800 00	1,349 60	1,196 07	7.054 29
27 Stratford	1,172 33	1,300 00	5,500 00	1,627 00	658 32	10,257 65
28 Strathroy	1,070 85	1,971 90	2,200 00	1,202 00	195 18	6,639 93
29 St. Catharines	1,164 80	1,766 21	5,006 71	314 00	274 14	8,525 86
30 St. Marys	962 34	799 20	2,700 00	1,204 00	163 66	5.819 20
31 St. Thomas	1,303 24	1,422 19	5,271 99	1.056 95	226 00	9,280 35
32 Toronto (Harbord)	1,328 42	.....	13,754 00	7,612 11	.....	22,694 53
33 " (Jameson)	1,311 74	.....	13,754 00	4.590 11	1.641 97	21 297 82
34 " (Jarvis)	1,303 62	....	13 754 00	5,334 12	2,780 76	23,172 50
35 Whitby	899 53	899 53	2.375 94	395 00	767 77	5,337 77
36 Wind-or	1.116 58	1,123 59	5,701 99	....	317 29	8,2 9 45
37 Woodstock	1,231 57	2,136 46	2,800 00	2,072 25	1,396 04	9,636 32
1 Total, 1898	41,923 59	45,596 86	215,210 77	66,587 81	49,164 60	418,483 63
2 " 1897	44 597 16	43,518 83	201,519 03	70,572 35	34,483 24	394,690 61
3 Increase	.....	2,078 03	13,691 74	.....	14,681 36	23,793 02
4 Decrease	2,673 57	.....	....	3,984 54	.... ..	.. ..
5 Percentage	10	11	51	16	12	.....

Cost per

The Collegiate Institutes.

	Expenditure.						Charges per year.
	Teachers' salaries.	Building, rent and repairs.	Maps, apparatus, prizes and libraries.	Fuel, books and contingencies.	Total expenditure.	Balances.	
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
1	3,780 00	23 65	43 09	1,045 42	4,892 16	....	$10; $5, Form I.
2	5,606 58	73 30	16 50	937 83	6,634 21	434 97	$10.
3	8,592 93	1,221 84	221 29	2,824 32	12,860 38	.. ..	Res. $10; non-res. $16.
4	6,485 30	660 75	56 80	1,307 74	8,510 59	1,908 68	Res free; Co. pupils, $2.50.
5	7,490 00	376 66	207 87	1,167 31	9,241 84	225 37	Res. $6; non-res. $10.
6	4,471 34	278 12	63 21	548 79	5,361 46	872 53	$6, $8, $10; Forms I, II, III & IV.
7	4,834 05	198 12	48 65	6,648 73	11,729 55	183 26	Res. $12; non-res. $14; Co. $7.50.
8	4,061 53	26 32	2 00	1,368 84	5,458 69	209 92	Town, $7.50; Co. $10; outs. $15.
9	7,000 00	99 49	....	1,564 16	8,663 65	9 25	Co. $10; all others, $14.
10	5,400 00	79 81	17 25	773 37	6,270 43	1,335 81	I, II, III and IV Res ..... $5 $7 $10 Co ..... 6 8 10 Non-res.... 8 10 12
11	5,900 00	.....	67 70	1,481 74	7,449 44	347 46	Res. free; others, $20.
12	17,432 00	2,409 52	.....	15,337 42	35,178 94	.....	Res. F. I, $2.50; non-res. $30; others, $10.
13	4,621 66	381 12	176 26	744 14	5,923 18	61 08	$7.50.
14	10 296 83	175 45	379 78	1,252 35	12.104 41	....	Res. $10; non-res. $20.
15	7,172 15	164 33	126 68	1,412 77	8,875 93	11 19	Res $10; non-res. $20.
16	22,801 60	10,585 13	253 72	5,574 56	39,215 01	....	Res. free; Co. $1 per mo.; F. III, IV, $1 per mo.; others, $3 per mo.
17	4,921 34	1,090 84	207 34	211 21	6,430 73	2,340 17	$6.
18	5,155 00	54 23	83 15	948 48	6,240 86	622 15	Res. free; non-res. $10.
19	5,015 00	412 95	5 50	1.057 28	6 490 73	253 73	Free.
20	15,165 00	.....	207 94	3,051 22	18,424 16	2,970 11	F. I, II, res. $20; non-res. $30; F. III, IV, res. $25; non-res. $35; F. III, IV, res. 25; non-res. $35.
21	8,860 00	54 86	123 11	1,495 95	10,533 92	460 47	F. I, free; F. II, $8, $10; III, IV, $10, $18.
22	4,722 77	88 51	174 45	817 69	5,803 42	355 13	Res. free; non-res. $16; Co. $5.
23	7,685 50	1,100 00	106 00	1,830 98	10,722 48	82 02	$5, $10, $25.
24	4,489 60	411 14	... .	1,186 32	6,087 06	390 33	Res. $6; non-res. $10; Co. $10.
25	6,076 86	561 48	....	709 36	7,347 70	1,003 40	Free.
26	4,907 11	130 75	37 03	747 67	5,822 56	1,231 73	F. I, $6; F. II, $8; F. III, IV, $10.
27	7 350 00	520 45	103 32	2,203 72	10,177 49	80 16	Res. and Co. $10; non-res. $20; non-res. in F. II, III, IV, $10.
28	5,350 00	103 97	....	1,175 31	6.629 28	10 65	$10; town pupils, F. I, free.
29	6,898 87	....	.....	1,626 45	8,525 32	54	Res. free; outside Co. $16.
30	4,829 60	29 09	....	742 30	5,600 99	218 21	Town $5; Co. $10; out. Cos. $15.
31	7,314 85	573 57	.. ..	1.391 93	9,280 35	.....	Co. $10; city, F. I, free; II, III, IV, $10.
32	17,157 00	514 67	114 00	3,858 77	21,644 44	1,050 09	$16; $23; $32.
33	13.717 81	3,791 82	263 09	3,625 10	21.297 82	....	$16; $23; $32.
34	16 228 00	2,774 76	319 32	3,850 42	23.172 50	..... .	$16; $23; $32.
35	4.426 66	135 84	.. .	715 33	5,277 83	59 94	Town, $6; Co. $7.50; out. $10.
36	6,185 00	344 48	348 06	1,381 91	8,259 45	.....	Free.
37	6,830 00	174 83	55 90	1,058 64	8,119 37	1,516 95	Res. $7.50; non-res. $10.
1	289 231 94	29,621 85	3,829 01	77,575 53	400,258 33	18,225 30	9 Free. 28 Fee.
2	288,769 73	18,377 53	3,870 82	65,813 81	376,831 89	17,858 72	10 Free. 27 Fee.
3	462 21	11,244 32	..... .	11,761 72	23,426 44	366 58	1 Fee.
4	. ....	.....	41 81	.. . .	...	....	1 Free.
5	72	7	1	20			

pupil, $34.54.

VIII.—TABLE H.—The

High Schools.	Receipts.					
	Legislative grants.	Municipal grants (county).	Municipal grants (local).	Fees.	Balances and other sources.	Total receipts.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1 Alexandria	565 06	565 06	1,155 00	.....	3,554 67	5,839 79
2 Almonte	638 63	638 63	2,361 20	281 50	397 51	4,317 47
3 Arnprior	595 10	717 10	689 39	29 00	1,173 38	3,203 97
4 Arthur	492 52	536 37	150 00	892 15	633 10	2,704 14
5 Athens	696 53	1,681 05	1,600 00	155 25	1,087 42	5,220 25
6 Aurora	616 33	700 00	750 00	637 00	104 92	2,808 25
7 Beamsville	464 61	464 61	525 00	68 00	190 38	1,712 60
8 Belleville	873 86	731 50	3,949 06	217 34	.....	5,771 76
9 Berlin	824 21	1,874 92	1,500 00	902 75	546 82	5,648 70
10 Bowmanville	779 30	1,072 38	2,255 00	656 20	952 77	5,715 65
11 Bradford	603 54	603 54	400 00	569 00	666 57	2,842 65
12 Brampton	830 12	1,760 12	1,400 00	1,391 00	26 80	5,408 04
13 Brighton	454 66	454 66	800 00	102 50	506 04	2,317 86
14 Caledonia	588 45	1,475 48	600 00	560 00	664 82	3,888 75
15 Campbellford	676 26	676 26	1,651 57	639 50	368 91	4,012 50
16 Carleton Place	662 61	662 61	2,300 00	280 00	1,891 23	5,796 45
17 Cayuga	535 26	1,349 03	500 00	277 50	197 98	2,859 77
18 Colborne	447 54	446 99	900 00	212 50	1,554 26	3,561 29
19 Cornwall	766 08	1,647 65	3,166 74	164 00	2,396 47	8,140 94
20 Deseronto	629 88	629 88	2,100 00	121 75	249 04	3,780 55
21 Dundas	621 94	800 00	630 10	705 00	721 75	3,478 79
22 Dunnville	628 75	1,775 40	700 00	374 75	631 45	4,110 35
23 Dutton	538 36	762 92	500 00	585 00	1,169 51	3 555 79
24 Elora	536 98	735 98	850 00	498 25	5 00	2,626 21
25 Essex	727 07	1,903 85	1,400 00	24 89	68 27	4,124 08
26 Fergus	568 89	906 74	4,400 00	72 00	2,709 10	8,656 73
27 Forest	595 40	1,365 17	800 00	201 00	317 80	3,279 37
28 Gananoque	652 97	852 97	1 905 16	56 00	.....	3,467 10
29 Georgetown	692 40	781 98	1,228 91	949 50	.....	3,652 79
30 Glencoe	664 44	1,022 17	900 00	746 50	89 17	3 422 28
31 Gravenhurst	965 78	.....	769 61	418 69	75 70	2,229 78
32 Grimsby	423 59	505 53	626 00	41 00	68 00	1,664 12
33 Hagarsville	626 41	1,682 16	1,214 99	368 25	14 65	3,906 46
34 Harriston	673 43	768 61	1,000 03	1,017 25	633 20	4,092 49
35 Hawkesbury	552 35	1,052 35	1,100 00	38 00	76 13	2,818 83
36 Iroquois	746 96	1,357 15	1,452 00	612 00	877 30	5,045 41
37 Kemptville	675 88	875 88	1,566 64	883 00	.....	4,001 40
38 Kincardine	787 27	1,487 27	1,280 00	760 00	511 54	4,826 08
39 Leamington	654 21	1,379 20	1,825 00	12 65	280 06	4,151 12
40 Listowel	644 86	800 00	800 00	973 00	29 41	3,247 27
41 Lucan	591 19	1,072 37	300 00	751 00	290 13	3,004 69
42 Madoc	502 63	823 61	700 00	491 00	567 70	3,084 94
43 Markham	695 97	1,076 76	400 00	1,375 50	579 50	4,127 73
44 Meaford	748 07	1,176 54	850 00	833 50	373 64	3,981 75
45 Mitchell	617 70	800 00	1,100 00	519 00	1,540 95	4,577 65
46 Mount Forest	746 06	696 06	1,400 00	634 25	1,059 43	4,535 80
47 Newburgh	531 20	1,650 00	630 81	106 00	75 21	2,993 22
48 Newcastle	460 21	.....	460 21	137 50	1,000 00	2,057 92
49 Newmarket	650 20	700 00	1,100 00	625 50	813 43	3,889 13
50 Niagara	435 78	435 78	550 00	.....	81 30	1,502 86
51 Niagara Falls, S	591 52	591 45	2,310 42	68 00	115 57	3,676 96
52 Norwood	613 88	269 65	1,284 62	619 50	1,062 98	3,850 63
53 Oakville	479 04	1,069 95	225 00	384 50	883 07	2,991 56
54 Omemee	433 66	433 66	508 09	246 50	111 66	1,733 57
55 Orangeville	764 37	1,050 00	1,436 00	1,515 10	450 97	5,216 44
56 Orillia	843 65	843 65	2,500 00	866 25	6,290 50	11,344 05

High Schools.

	Expenditure.						Charges per year.
	Teachers' salaries.	Building, rent and repairs.	Maps, apparatus, prizes and libraries.	Fuel, books and contingencies.	Total expenditure.	Balances.	
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
1	2,609 36	70 46	16 30	2,610 60	5,306 72	533 07	Free.
2	3,164 42	600 00	37 53	250 05	4,052 00	265 47	Res. $1; non-res. $11; Co. $6.
3	2,176 06	2 8 93	59 00	477 19	2,941 18	262 79	Res. & Co. free; non-res. $10.
4	2,119 66	71 51	132 40	379 78	2,703 35	79	$1 per mo.
5	3,330 00	187 63	11 85	1,445 86	4,975 34	244 91	Res. free; non-res. $10; Co. $2.50.
6	2,123 47	92 83	73 02	420 00	2,709 32	98 93	$10.
7	1,373 33	50 60	.....	270 78	1,694 71	17 89	Free.
8	4,966 79	203 00	36 90	565 07	5,771 76	.....	$10.
9	4,119 00	84 92	97 53	818 18	5,119 63	529 07	Res. & Co. $10; non-res. $15.
10	3,600 00	318 60	47 25	772 03	4,737 88	977 77	F. I, $4; F. II, $6; F. III, IV, $7.50.
11	2,335 50	2 80	28 00	369 11	2,735 41	107 24	F I free to res.; others, $10.
12	4,520 00	62 30	24 07	725 08	5,331 45	76 59	$10.
13	1,599 96	50 76	17 61	363 26	2 031 59	286 27	75c. per mo.
14	2,240 62	123 59	3 57	488 52	2,856 30	1,032 45	$4 50.
15	3,065 58	129 29	29 08	788 55	4,012 50	....	Dist. $6; Co. $7.50; non-res. $10.
16	3,150 00	47 64	86 00	478 22	3,761 86	2,034 59	Res free; non-res. $10; Co. $5.
17	2,350 00	124 86	.....	358 56	2,833 42	26 35	$1 50.
18	1 525 00	120 39	77 56	234 21	1.957 16	1,604 13	75c. per mo.
19	4,649 92	182 14	.....	958 84	5,790 90	2,350 04	Free.
20	2,450 00	215 47	2 50	802 28	3,470 25	260 30	Res. free; non-res. & Co. $10.
21	2,600 00	112 29	27 70	584 57	3,324 56	154 23	F. I free; town, $9.50; Co. $10.
22	2,649 73	800 35	.....	660 27	4.110 35	.....	Town, $4.50; Co. $4.50; out. Co. $15.
23	1,865 00	83 69	.....	383 01	2,331 70	1,224 09	$10.
24	2,200 00	16 60	21 00	360 55	2,598 15	28 06	Res. $5; non-res. & out. Co. $10.
25	3,135 57	104 81	.....	259 42	3,499 80	624 28	Free.
26	2,625 00	5,257 99	.....	393 98	8,276 97	379 76	Res. free; non-res. $10.
27	1,750 03	135 38	27 00	543 98	2,456 39	822 98	Town $1 per mo.
28	2,400 00	445 79	.....	621 31	3,467 10	.....	$2.50.
29	2,875 00	289 73	52 31	435 75	3,652 79	.....	F. I, $7; others, $10.
30	2,715 00	104 02	.....	600 95	3,419 97	2 31	Res. free; non-res. $20; Co. $10.
31	1,572 41	104 42	.....	533 84	2,210 67	19 11	$10.
32	1,300 00	36 72	.....	175 42	1,512 14	151 98	Res. free, except to non-res. out of Co.
33	2,400 00	7 50	9 30	513 61	2,930 41	976 05	$4.50.
34	3,350 00	26 61	.....	706 89	4,083 50	8 99	Res. & Co. $10; other Cos. $15.
35	2,100 00	200 00	.....	396 21	2,696 21	122 62	Free.
36	3,195 13	90 00	94 73	742 22	4,122 08	923 33	$6
37	3,151 50	125 14	22 50	702 26	4,001 40	.....	Res. free; non-res. $15; Co. $2.50.
38	4,000 00	66 36	57 74	623 16	4,747 26	78 82	Dist $8; Co. $10.
39	3,000 00	20 40	23 52	396 66	3,440 58	710 54	Co. free; other Cos. $10.
40	2,300 00	.....	44 25	903 02	3,247 27	.....	Co. $10; outsiders, $12.
41	2,190 00	33 75	43 46	489 53	2,756 74	247 95	$10.
42	1,816 60	362 05	.....	401 12	2,579 77	505 17	Res $7; others, $10.
43	3,300 00	110 21	140 23	459 23	4,009 67	118 06	$10.
44	2,998 31	113 11	.....	737 99	3,849 41	132 34	$10; $8.
45	2,650 00	60 20	36 49	1,828 08	4,574 77	2 88	Res. $5; non-res. $10.
46	2,449 80	102 05	.....	1,784 75	4,336 60	199 20	$10; F. I free to res.
47	2,125 18	163 82	70 43	508 14	2,867 57	125 65	Free.
48	1,225 00	359 17	99 00	335 74	2 018 91	39 01	Res. free; outside $7.50.
49	2,432 22	40 00	219 58	968 52	3,660 32	228 81	$10.
50	1,250 00	14 08	11 25	172 23	1,447 56	55 30	Free.
51	2,200 00	72 20	.....	450 35	2,722 55	954 41	Free.
52	2,150 00	650 90	.....	590 00	3,390 90	459 73	Res. & Co. $6; non-res. $15.
53	1,800 00	46 09	34 68	352 50	2,233 27	758 29	$5; $8.
54	1,400 00	36 03	107 74	189 80	1,733 57	.....	Dist. 50c. per mo.; out. $1.
55	4,074 60	166 24	154 51	478 13	4,873 48	342 96	Dist. $9; Co. & out. $10.
56	4,249 18	532 39	.....	6,429 41	11,210 98	133 07	Res. $5; non-res. $10.

VIII.—TABLE H.—The

High Schools.	Receipts.					
	Legislative grants.	Municipal grants (county).	Municipal grants (local).	Fees.	Balances and other sources.	Total receipts
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
57 Oshawa	721 34	1,161 93	1,817 00	695 90	745 97	5,142 14
58 Paris	621 84	655 66	2,100 00	174 00	604 18	4,155 68
59 Parkhill	549 86	556 65	700 00	455 50	897 23	3,159 24
60 Pembroke	676 91	747 95	2,538 61		208 83	4,172 30
61 Petrolea	735 43	1,211 76	2,600 00	153 00	2,199 96	6,900 15
62 Picton	808 48	2,073 10	2,500 00		879 29	6,260 87
63 Port Arthur	1,106 09		1,215 68	36 00	1,373 02	3,730 79
64 " Dover	440 09	512 68	861 21	46 00		1,859 98
65 " Elgin	590 26	815 26	800 00	527 75	435 51	3,168 78
66 " Hope	810 87	1,530 04	1,678 79	1,171 00	163 11	5,353 81
67 " Perry	681 43	1,231 68	1,417 00	500 50	165 64	3,996 25
68 " Rowan	414 04	627 13	450 64	31 00		1,522 81
69 Prescott	612 95	400 00	1,804 00	31 50	118 56	2,967 01
70 Renfrew	664 39	1,064 39	1,474 01	189 60	369 83	3,762 22
71 Richmond Hill	468 28	700 00	1,032 71	625 50	1,462 13	4,288 62
72 Simcoe	774 27	2,388 18	1,012 77	10 00	135 00	4,320 22
73 Smith's Falls	673 73	673 73	1,891 78	212 00	95 00	3,546 24
74 Smithville	453 81	464 24	715 00		597 52	2,230 57
75 Stirling	474 41	471 41	900 00	123 00	439 45	2,408 27
76 Streetsville	434 46	896 34	200 00	267 50	523 77	2,322 07
77 Sydenham	563 02	1,600 00		478 50	297 47	2,938 99
78 Thorold	579 68	578 60	1,850 00	33 00	170 09	3,211 37
79 Tilsonburg	631 46	619 46	1,600 00	213 54		3,064 46
80 Toronto Junction	902 47	835 58	3,419 63	1,777 50	190 56	7,125 74
81 Trenton	608 56	416 70	1,880 43	170 55	496 64	3,572 88
82 Uxbridge	620 54	831 61	1,210 00	453 50	254 01	3,369 66
83 Vankleekhill	624 02	1,724 02	1,200 00	268 00	565 81	4,381 85
84 Vienna	441 30	441 30	600 00		431 43	1,914 03
85 Walkerton	790 47	1,590 47	1,210 00	821 00	669 17	5,081 11
86 Wardsville	426 41	426 41	504 50	206 25	530 43	2,094 00
87 Waterdown	492 07	892 07	450 00	165 00	116 89	2,116 03
88 Waterford	601 63	1,413 30	700 00	68 00	469 03	3,251 96
89 Watford	664 61	1,764 92	300 00	404 00	1,904 61	5,038 14
90 Welland	632 96	1,572 75	1,650 00	98 00	164 45	4,118 16
91 Weston	468 83	778 56	300 00	394 00	307 38	2,248 77
92 Wiarton	572 31	1,277 31	1,000 00	350 50	62 47	3,262 59
93 Williamstown	522 51	522 51	1,830 00	80 00	1,527 42	4,482 44
						2,917 18
1 Total, 1898	58,279 41	87,660 35	116,870 28	37,897 86	60,259 03	360,966 93
2 " 1897	56,652 84	89,209 75	117,167 04	40,287 04	69,479 79	372,796 46
3 Increase	1,626 57					
4 Decrease		1,549 40	296 76	2,389 18	9,220 76	11,829 53
5 Percentage	17	24	32	10	17	

Cost per

High Schools.

	Expenditure.						Charges per year.
	Teachers' salaries	Building, rent and repairs	Maps, apparatus, prizes and libraries.	Fuel, books and contingencies.	Total expenditure.	Balances.	
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
57	4,049 61	816 93	.....	250 08	5,116 62	25 52	$7.50.
58	2,893 45	278 20	44 60	635 44	3,851 69	303 99	Dist. free; others, $1 per mo.
59	1,930 00	188 68	10 49	428 46	2,557 63	601 61	F. I, II, $6; III, IV, $8; Co. $10.
60	3 379 00	154 49	88 80	343 19	3,965 48	206 82	Free.
61	4,000 00	45 43	23 41	555 48	4,624 32	2,275 83	Free.
62	4,300 00	267 42	134 17	1,559 28	6,260 87	.....	Free Co. & town; non-res. $1 per mo.
63	2,082 35	.....	.....	353 71	2,436 06	1,294 73	Free.
64	1,580 79	30 84	48 71	199 64	1,859 98	.....	Free.
65	2,550 00	228 32	39 83	347 55	3,165 70	3 08	Res. $6.50; res. F. I $3.50; non-res. & Co. $10.
66	4,260 00	.....	20 25	1,073 56	5,353 81	.....	Town, $9; Co. $7.50.
67	3,350 00	225 55	.....	420 70	3,996 25	.....	Res. & Co. $7.50; non-res. $10.
68	1,250 00	168 96	32 00	71 85	1,522 81	.....	Free.
69	2,208 32	22 86	11 00	706 12	2,948 30	18 71	Res. free; non-res. $2.50.
70	3,028 98	445 92	...	287 32	3,762 22	.....	Free.
71	1,607 49	2,155 07	251 45	118 11	4,132 12	156 50	$10.
72	3,770 00	146 49	45 54	358 19	4,320 22	.....	Res. free; non-res. $1 per mo.
73	3,000 00	64 29	47 60	434 35	3,546 24	.....	Res. free; non-res. $10; Co. $5.
74	1,380 00	32 99	36 82	185 85	1,635 66	594 91	Free.
75	1,650 00	62 25	.....	446 97	2,159 22	249 05	Res. free; Co. $10.
76	1,400 00	200 57	58 10	447 61	2,106 28	215 79	$5.
77	2.300 00	310 00	7 84	321 15	2,938 99	.....	Res. free; Co. $6; out. Co. $12.
78	1,910 00	471 04	22 80	381 56	2,785 40	425 97	Free.
79	2.499 40	60 00	23 39	481 67	3,064 46	.....	$6.
80	4,716 23	395 12	118 32	954 56	6,184 23	941 51	$10; $15.
81	2,425 15	137 80	26 88	710 32	3,300 15	272 73	Res. free; out. Co. $5 per term.
82	2,700 00	52 41	54 26	557 77	3,364 44	5 22	Res. $5; non-res. $7.50.
83	2 675 00	885 45	17 67	611 60	4,189 72	192 13	Res. free; non-res. $10.
84	1,264 07	16 31	12 95	293 95	1,587 28	326 75	Free.
85	4,105 00	180 00	.....	256 11	4,541 11	540 00	$10.
86	1,341 67	9 90	15 71	716 15	2,083 43	10 57	Res. $3; non-res. & Co. $10.
87	1,950 00	.....	.....	166 03	2,116 03	.....	50c. per mo.
88	2,200 00	215 81	.....	407 65	2,823 46	428 50	Free.
89	2,720 50	27 64	33 59	911 56	3,693 29	1,344 85	$10.
90	3,000 00	190 22	98 43	461 50	3,750 15	368 01	Res. free; non-res. $1 per mo.
91	1,750 00	182 65	60 84	236 40	2,229 89	18 88	$10.
92	2,193 99	116 75	56 48	815 41	3,182 63	79 96	Res. $5; others, $10.
93	2,270 00	.....	.....	2,136 44	4,406 44	76 00	Free.
1	242,654 93	22,644 17	3,519 52	59,932 06	328,750 68	32,216 25	42 free. 51 fee.
2	244,067 00	28,249 41	5.703 65	61,124 45	339,144 51	33,651 95	33 free. 60 fee.
3	.....	.....	.....	.....	.....	.....	9 free.
4	1,412 07	5,605 24	2,184 13	1,192 39	10,393 83	1,435 70	9 fee.
5	73	7	1	19	.....	.....	

pupil, $28.56.

IX.—TABLE I.—The

Collegiate Institutes.	Pupils.				Number of pupils			
	Boys.	Girls.	Total.	Average attendance.	Reading.	English Grammar and Rhetoric.	English Composition.	Poetical Literature.
1 Aylmer	70	73	143	91	90	90	143	143
2 Barrie	147	114	261	148	191	191	257	259
3 Brantford	173	163	336	194	273	262	329	329
4 Brockville	151	180	331	205	254	254	331	331
5 Chatham	170	179	349	202	349	272	349	349
6 Clinton	119	94	213	126	197	146	210	211
7 Cobourg	77	79	156	90	122	122	156	156
8 Collingwood	94	101	195	107	151	163	195	195
9 Galt	123	133	256	153	194	199	252	250
10 Goderich	99	116	215	142	158	170	210	210
11 Guelph	119	144	263	173	176	176	263	263
12 Hamilton	336	434	770	489	388	507	767	767
13 Ingersoll	82	73	155	90	122	122	151	151
14 Kingston	214	293	507	320	298	487	495	495
15 Lindsay	153	112	265	154	209	201	265	265
16 London	524	503	1,027	625	773	672	991	991
17 Morrisburg	114	107	221	144	146	150	221	221
18 Napanee	95	125	220	152	171	171	220	220
19 Niagara Falls	118	125	243	128	180	180	243	243
20 Ottawa	248	176	424	255	323	323	424	424
21 Owen Sound	189	196	385	226	210	223	385	385
22 Perth	87	130	217	136	187	187	215	215
23 Peterborough	140	136	276	196	210	196	228	228
24 Ridgetown	108	101	209	125	162	162	209	209
25 Sarnia	117	142	259	136	201	208	259	259
26 Seaforth	99	105	204	117	147	147	200	200
27 Stratford	147	145	292	174	227	227	292	290
28 Strathroy	92	115	207	139	190	152	202	202
29 St. Catharines	144	174	318	169	187	318	318	318
30 St. Marys	97	104	201	127	131	238	201	206
31 St. Thomas	189	190	379	240	291	191	379	379
32 Toronto (Harbord)	252	259	511	327	287	344	511	511
33 " (Jameson)	188	186	374	230	285	285	368	368
34 " (Jarvis)	227	213	440	235	292	292	440	440
35 Whitby	100	67	167	101	124	124	167	167
36 Windsor	156	138	294	177	264	224	291	291
37 Woodstock	164	164	328	190	190	190	190	320
1 Total 1898	5,722	5,889	11,611	7,033	8,350	8,606	11,327	11,456
2 " 1897	5,996	6,212	12,208	7,487	9,031	9,610	12,107	12,097
3 Increase								
4 Decrease	274	323	597	454	681	1,004	780	641
5 Percentage	49	51			72	74	97	98
6 Percentage of average to total attendance	60							

Collegiate Institutes.

in the different branches of instruction.

	Supplementary Reading in English Literature.	Canadian History.	English History.	Ancient History.	Geography.	Arithmetic and Mensuration.	Algebra.	Geometry.	Trigonometry.	Physics.	Chemistry.	Botany.
1	143	52	50	50	93	90	138	91	12	71	50	101
2	261	191	200	70	68	191	259	230	12	148	46	128
3	3 9	262	280	77	170	273	329	320	16	145	69	185
4	331	254	283	79	160	254	331	171	31	146	62	188
5	349	272	292	77	272	272	349	225	15	127	41	157
6	116	147	210	78	210	197	211	211	14	105	60	119
7	156	122	122	34	104	122	156	112	8	30	26	104
8	195	195	195	65	96	163	195	148	7	101	76	105
9	250	196	250	66	149	199	250	250	19	57	45	75
10	210	182	182	69	208	172	208	118	16	110	52	115
11	263	176	176	87	114	176	263	149	29	89	54	116
12	760	423	518	347	350	512	763	541	115	363	224	326
13	151	122	137	42	100	122	152	66	17	53	34	112
14	495	189	289	96	147	421	495	205	6	106	85	109
15	265	179	221	91	109	221	221	154	12	192	85	85
16	991	773	983	243	450	773	993	538	65	325	210	571
17	221	150	175	60	87	150	221	221	25	145	40	123
18	220	169	184	49	119	171	220	220	18	72	36	129
19	243	180	202	63	109	180	243	130	22	93	46	143
20	424	128	225	101	235	323	424	296	30	170	78	125
21	385	223	257	175	111	223	385	274	40	234	150	231
22	215	186	196	34	130	187	216	120	13	104	37	123
23	228	196	204	70	193	200	228	240	8	96	42	157
24	209	162	188	69	96	164	209	135	26	107	50	94
25	250	212	219	48	180	208	227	108	7	83	35	190
26	147	147	85	56	87	147	190	193	8	94	60	155
27	290	267	267	94	198	227	227	192	26	138	56	121
28	202	152	177	71	200	152	204	147	22	35	55	95
29	318	187	279	63	187	253	316	122	26	84	49	199
30	201	138	155	41	103	131	201	160	29	110	28	106
31	379	291	379	58	227	291	379	229	30	112	56	135
32	511	364	364	207	158	364	511	492	67	232	146	184
33	368	138	316	84	142	285	362	332	26	184	76	192
34	440	440	440	148	109	292	440	440	40	238	115	95
35	167	124	124	30	83	124	167	125	10	56	26	109
36	260	254	290	44	249	249	290	130	12	125	30	200
37	320	190	320	110	190	190	320	206	30	86	87	103
1	11,263	8,033	9,434	3,246	5,973	8,669	11,323	8,041	906	4,766	2,517	5,605
2	11,860	8,883	10,367	3,239	6,962	9,560	12,185	8,389	1,080	5,086	2,623	6,253
3				7								
4	597	850	933		989	891	862	348	174	320	106	648
5	96	69	81	28	51	74	97	69	8	41	22	48
6												

IX.—TABLE I.—The

High Schools.	Pupils.				Number of pupils			
	Boys.	Girls.	Total.	Average attendance.	Reading.	English Grammar and Rhetoric.	English Composition.	Poetical Literature.
1 Alexandria	53	70	123	82	123	106	123	123
2 Almonte	84	59	143	88	129	129	143	143
3 Arnprior	51	71	122	68	122	109	122	122
4 Arthur	60	58	118	77	88	88	118	118
5 Athens	88	100	188	114	135	137	188	188
6 Aurora	54	41	95	58	95	69	95	95
7 Beamsville	42	31	73	39	62	62	73	73
8 Belleville	114	168	282	140	282	219	282	282
9 Berlin	95	59	154	76	130	138	154	154
10 Bowmanville	79	73	152	87	113	113	152	152
11 Bradford	53	60	113	65	95	96	113	113
12 Brampton	94	96	190	122	121	134	190	190
13 Brighton	37	29	66	46	53	53	66	66
14 Caledonia	69	72	141	90	110	110	139	139
15 Campbellford	75	56	131	81	83	87	131	131
16 Carleton place	81	99	180	106	157	157	180	180
17 Cayuga	53	36	89	55	63	63	88	88
18 Colborne	44	31	75	45	51	51	75	75
19 Cornwall	94	106	200	125	200	180	200	200
20 Deseronto	45	74	119	71	94	94	119	119
21 Dundas	65	67	132	74	114	114	132	132
22 Dunnville	59	71	130	77	97	97	125	123
23 Dutton	38	53	91	56	21	64	91	91
24 Elora	57	42	99	58	77	77	97	97
25 Essex	48	58	106	67	71	71	106	106
26 Fergus	68	81	149	96	149	95	149	149
27 Forest	42	52	94	55	60	61	91	91
28 Gananoque	50	89	139	83	115	115	139	139
29 Georgetown	65	54	119	72	87	87	119	119
30 Glencoe	59	46	105	67	78	78	105	105
31 Gravenhurst	31	29	60	28	51	51	60	60
32 Grimsby	26	47	73	40	66	66	73	73
33 Hagarsville	51	49	100	64	73	73	100	100
34 Harriston	83	61	144	85	64	121	144	144
35 Hawkesbury	33	31	64	44	54	58	64	64
36 Iroquois	66	75	141	87	100	100	140	140
37 Kemptville	102	89	191	116	113	120	191	191
38 Kincardine	64	63	127	75	83	83	127	127
39 Leamington	71	56	127	75	102	102	127	127
40 Listowel	88	59	147	84	147	147	147	147
41 Lucan	77	35	112	68	79	79	112	112
42 Madoc	46	38	84	52	59	59	84	84
43 Markham	111	92	203	130	117	127	203	203
44 Meaford	77	75	152	90	113	113	152	152
45 Mitchell	56	50	106	70	89	89	106	106
46 Mount Forest	89	65	154	93	108	108	154	154
47 Newburgh	71	66	137	80	137	117	137	137
48 Newcastle	24	19	43	27	29	32	43	43
49 Newmarket	52	42	94	58	69	69	94	94
50 Niagara	22	28	50	28	44	44	50	50
51 Niagara Falls South	59	64	123	65	110	111	123	123
52 Norwood	67	58	125	75	85	85	124	124
53 Oakville	23	44	67	45	50	55	67	65

High Schools.

In the different branches of instruction.

	Supplementary Reading in English Literature.	Canadian History.	English History.	Ancient History.	Geography.	Arithmetic and Mensuration.	Algebra.	Geometry.	Trigonometry.	Physics.	Chemistry.	Botany.
1	123	106	106	35	46	106	123	123	....	49	25	46
2	143	129	135	17	102	134	142	58	9	34	20	88
3	122	109	109	15	109	109	122	122	4	53	10	76
4	118	52	46	26	52	92	118	66	6	61	20	72
5	188	137	137	70	48	137	188	140	.....	107	53	100
6	95	69	73	26	69	69	95	59	4	54	26	69
7	.....	62	62	14	42	62	73	73	.....	34	14	46
8	282	219	238	63	135	219	282	147	9	96	57	148
9	154	60	154	31	98	143	154	94	4	68	30	63
10	152	113	128	39	63	113	152	64	13	64	30	65
11	113	96	96	19	71	96	113	75	....	68	21	72
12	119	134	152	51	80	134	190	157	18	69	53	80
13	66	53	53	13	35	53	66	31	1	14	13	36
14	.....	110	110	41	71	110	139	139	.....	93	42	106
15	128	83	131	48	47	87	122	90	18	52	35	60
16	180	157	157	44	90	136	180	90	3	40	40	50
17	88	63	69	25	28	63	85	85	6	63	18	36
18	51	27	51	24	24	51	75	51	.....	29	24	25
19	72	180	180	38	200	184	200	170	2	80	40	85
20	67	104	110	25	71	104	119	70	6	61	20	74
21	132	114	114	18	40	114	132	50	1	40	23	114
22	121	92	96	28	69	111	108	70	4	65	22	53
23	91	64	64	27	21	64	91	70	4	67	27	84
24	97	38	83	30	29	80	96	55	6	44	33	47
25	106	71	106	35	32	71	106	74	12	62	31	44
26	149	95	104	54	149	95	149	101	9	101	45	60
27	91	61	61	31	26	61	91	90	....	44	30	26
28	139	115	115	31	78	115	139	139	.....	56	30	71
29	119	87	98	52	40	87	119	119	13	80	42	33
30	105	51	67	37	51	79	98	64	12	46	20	56
31	60	51	54	9	45	51	60	27	3	18	6	33
32	73	60	66	7	29	66	73	44	.....	37	7	29
33	100	73	73	44	45	73	100	70	1	49	42	53
34	144	64	144	80	62	144	144	120	14	116	117	36
35	64	54	54	10	26	54	64	38	.....	28	10	26
36	140	100	55	40	52	100	140	87	8	44	34	57
37	178	120	140	78	62	120	191	154	20	116	65	71
38	127	83	103	46	53	88	123	91	16	58	21	53
39	127	102	102	25	73	102	127	52	5	38	23	46
40	147	147	147	50	147	121	147	147	....	57	47	87
41	112	79	79	33	41	80	112	71	2	56	19	50
42	84	61	61	25	28	84	84	84	.....	52	25	50
43	203	127	146	86	52	127	203	151	19	143	72	113
44	152	113	133	73	49	113	152	137	20	92	49	80
45	100	89	89	32	64	89	106	106	6	41	25	60
46	154	108	115	46	93	108	154	154	7	88	46	100
47	137	117	117	20	70	117	137	137	.....	53	18	70
48	43	32	32	14	22	33	43	43	1	34	16	21
49	94	69	69	34	37	69	92	71	....	52	31	37
50	50	44	50	6	31	44	50	19	.. .. ..	13	6	30
51	123	110	110	19	123	111	123	106	....	95	17	115
52	124	85	85	38	124	85	124	70	... ..	35	38	33
53	65	26	26	24	35	52	65	62	.. .. ..	58	22	55

IX.—TABLE I.—The

High Schools.	Pupils.			Average attendance.	Number of pupils			
	Boys.	Girls.	Total.		Reading.	English Grammar and Rhetoric.	English Composition.	Poetical Literature.
54 Omemee	27	28	55	34	41	41	55	55
55 Orangeville	130	92	222	140	145	145	220	220
56 Orillia	100	126	226	122	170	226	226	226
57 Oshawa	99	103	202	130	171	171	202	202
58 Paris	53	52	105	55	56	84	105	105
59 Parkhill	53	42	95	60	58	58	95	95
60 Pembroke	94	89	183	110	153	153	183	183
61 Petrolea	100	93	193	116	164	164	193	193
62 Picton	136	125	261	161	194	194	261	261
63 Port Arthur	32	66	98	58	98	86	98	98
64 " Dover	48	42	90	53	72	90	90	90
65 " Elgin	61	50	111	71	88	89	110	110
66 " Hope	83	114	197	130	125	130	197	197
67 " Perry	67	68	135	83	130	120	135	130
68 " Rowan	24	15	39	22	35	35	39	39
69 Prescott	37	61	98	57	79	79	98	59
70 Renfrew	89	115	204	130	153	153	204	204
71 Richmond Hill	53	46	99	58	67	67	96	96
72 Simcoe	91	92	183	112	183	150	183	183
73 Smith's Falls	70	83	153	103	126	126	153	153
74 Smithville	37	45	82	42	66	70	82	82
75 Stirling	35	31	66	36	48	52	66	66
76 Streetsville	37	32	69	36	57	61	69	69
77 Sydenham	69	74	143	84	109	109	141	141
78 Thorold	27	62	89	60	67	67	89	89
79 Tilsonburg	55	61	116	97	98	98	116	116
80 Toronto Junction	133	131	264	147	186	186	257	257
81 Trenton	68	63	131	76	97	97	131	131
82 Uxbridge	61	58	119	76	88	88	119	119
83 Vankleekhill	78	91	169	102	111	111	169	169
84 Vienna	18	12	30	17	23	23	30	30
85 Walkerton	99	86	185	109	136	136	185	185
86 Walkerville	25	26	51	29	31	31	51	51
87 Waterdown	29	34	63	31	55	55	62	62
88 Waterford	47	40	87	51	73	73	87	87
89 Watford	60	84	144	96	90	90	144	144
90 Welland	65	80	145	90	108	108	145	145
91 Weston	33	30	63	29	59	63	63	63
92 Wiarton	47	49	96	56	65	65	96	96
93 Williamstown	23	64	87	45	77	78	87	87
1 Total 1898	5,798	5,892	11,690	7,033	9,069	9,065	11,659	11,611
2 " 1897	5,946	6 236	12,182	7,227	9,469	9,981	12,088	12,079
3 Increase								
4 Decrease	148	344	492	194	400	916	429	468
5 Percentage	50	50			78	78	100	100
6 Percentage of average to total attendance	60							

High Schools.

in the different branches of instruction.

	Supplementary Reading in English Literature.	Canadian History.	English History.	Ancient History.	Geography.	Arithmetic and Mensuration.	Algebra.	Geometry.	Trigonometry.	Physics.	Chemistry.	Botany.
54	21	41	41	14	20	41	55	35	.... ..	21	13	20
55	210	158	158	118	38	158	220	190	17	168	118	125
56	91	81	95	14	92	221	224	147	14	130	64	111
57	202	171	181	31	115	166	202	85	10	65	8	116
58	105	84	84	21	56	84	105	49	.....	32	21	56
59	95	35	160	35	25	58	95	95	2	63	33	48
60	183	153	154	23	104	153	183	79	5	52	28	103
61	193	141	157	28	82	157	190	109	4	84	22	85
62	248	194	200	67	132	194	255	255	13	88	53	160
63	.....	86	86	12	57	86	98	53	.....	41	12	45
64	72	72	72	18	48	72	90	42	.....	41	17	16
65	110	89	89	37	89	89	110	64	.....	42	35	57
66	197	130	156	78	92	150	195	162	26	83	40	92
67	130	80	59	55	51	85	130	125	12	48	50	38
68	.....	35	35	10	14	35	39	31	....	28	10	17
69	52	79	46	19	39	79	98	58	5	51	14	41
70	264	153	164	51	95	153	204	143	11	132	40	70
71	.....	67	67	29	43	67	96	96	.....	33	13	43
72	183	130	130	50	130	130	100	100	12	78	60	90
73	153	126	126	41	94	126	153	90	1	64	41	97
74	...	67	67	16	43	70	82	39	.....	38	15	51
75	66	52	52	18	66	52	66	66	5	50	18	32
76	69	61	61	12	40	61	68	40	.....	34	11	40
77	139	109	109	30	41	109	142	104	3	75	30	46
78	89	67	78	22	43	67	89	89	11	24	11	43
79	98	98	98	18	53	98	116	65	....	52	18	59
80	257	186	202	90	134	186	257	146	14	122	76	156
81	131	97	97	30	51	97	131	80	....	46	34	51
82	119	88	95	30	57	88	119	95	7	50	23	58
83	169	111	123	58	72	128	169	139	9	62	49	117
84	30	23	23	7	7	26	30	23	....	23	7	7
85	185	136	136	49	92	136	185	171	15	76	52	103
86	51	31	31	20	17	31	51	34	.....	18	20	17
87	56	56	56	7	34	56	62	62	.....	6	7	6
88	87	73	73	14	37	73	87	50	....	43	14	37
89	144	97	97	54	90	97	144	123	7	90	47	58
90	108	108	144	36	63	108	145	123	12	82	37	64
91	.....	48	59	19	48	59	63	63	....	55	19	63
92	96	65	67	31	45	65	96	70	2	51	23	37
93	65	79	79	10	55	81	87	47	.....	23	11	55
1	10 420	8,528	9 262	3,168	5,883	9,082	11,512	8,398	503	5,530	2,874	5,770
2	11,015	9,435	9,937	3,129	6,785	10,238	12,020	8,399	572	5,916	2,866	6,639
3	.....	.....	.....	39	.....	.....	.....	.....	.....	.....	8	.....
4	595	907	675	.....	902	1,156	508	1	69	386	.... ..	869
5	89	72	79	27	50	78	99	71	5	47	26	49
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

IX.—TABLE I.—The

Collegiate Institutes.	Number of pupils in the different branches of										
	Zoology.	Latin.	Greek.	French.	German.	Writing.	Book-keeping and Commercial Transactions.	Stenography	Drawing.	Vocal Music	Drill.
1 Aylmer	9	134	1	48	42	62	62	.....	62	....	64
2 Barrie	.....	185	7	166	24	43	116	71	116	.....	141
3 Brantford	8	243	22	233	123	166	184	73	168	.....	168
4 Brockville	1	291	11	308	107	160	160	.....	160	.....	.....
5 Chatham	3	297	58	214	51	120	156	15	156	.....	329
6 Clinton	8	193	12	133	41	30	91	39	91	.....	113
7 Cobourg	.....	145	10	140	20	44	104	.....	104	.....	77
8 Collingwood	2	165	19	113	19	96	96	14	96	.....	175
9 Galt	1	151	13	99	93	72	145	54	144	.....	103
10 Goderich	1	139	10	98	18	75	112	25	112	....	82
11 Guelph	4	195	9	216	167	114	114	59	114	.....	224
12 Hamilton	20	673	59	549	388	279	294	110	296	.....	665
13 Ingersoll	6	99	.....	99	50	100	100	33	100	.....	81
14 Kingston	2	399	17	371	170	207	184	89	107	.....	.....
15 Lindsay	1	225	21	147	53	79	109	19	109	.....	150
16 London	31	796	43	461	99	551	501	198	450	..	978
17 Morrisburg	4	212	18	170	40	103	103	81	107	30	202
18 Napanee	3	196	8	182	38	83	119	56	119	.....	207
19 Niagara Falls	6	175	30	150	58	109	142	65	128	.....	221
20 Ottawa	4	314	56	298	113	128	212	111	212	.....	248
21 Owen Sound	30	323	20	104	92	111	115	52	111	.....	210
22 Perth	2	188	30	135	29	96	126	.....	130	.....	20
23 Peterborough	3	107	3	172	52	32	193	28	193	....	140
24 Rdgetown	6	189	12	94	24	98	98	24	100	.....	200
25 Sarnia	.....	180	30	166	38	59	180	.....	180	.....	104
26 Seaforth	4	181	20	132	32	87	147	.....	147	.....	99
27 Stratford	2	262	36	100	69	100	100	35	100	.....	145
28 Strathroy	15	180	8	75	38	110	80	40	80	.....	80
29 St. Catharines	12	302	25	186	135	187	187	.....	187	.....	129
30 St. Mary's	3	196	23	153	48	26	103	.....	103	.....	83
31 St. Thomas	3	246	25	217	76	81	227	150	227	.....	189
32 Toronto (Harbord)	9	404	60	490	269	74	177	77	196	.....	230
33 " (Jameson)	12	342	28	328	140	125	178	68	182	.....	158
34 " (Jarvis)	5	415	27	343	179	109	159	40	158	.....	209
35 Whitby	.....	150	7	120	20	83	83	40	83	.....	160
36 Windsor	.....	254	13	211	63	90	200	.....	210	.....	151
37 Woodstock	9	249	44	111	63	195	195	49	190	.....	328
1 Total, 1898	229	9,395	835	7,332	3,081	4,284	5,652	1,715	5,528	30	6,863
2 " 1897	361	8,954	871	7,453	2,869	5,204	5,652	1,206	6,144	30	8,313
Increase	.....	441	....	.....	212	.....	.....	509	..	.....	....
4 Decrease	132	.....	36	121	.....	920	.....	.....	616	.....	1,450
5 Percentage	2	80	7	63	26	36	48	15	47	½	59

Collegiate Institutes.

	Instruction.		Examinations, etc.												
	Calisthenics.	Gymnastics.	How many pupils obtained Commercial Diplomas in 1898?	No. passed Primary Examination	No. passed Junior Leaving Examination.	No. passed Senior Leaving Examination.	No. passed Departmental Matriculation Examination.	No. passed the Junior Matriculation Examination at any University.	No. passed the Senior Matriculation Examination at any University.	No. 1st Class Matriculation Honors.	No. 2nd Class Matriculation Honors.	No. passed Matriculation Examination, Law Society, 1898.	No. passed Matriculation Examination, Medical Council, 1898.	No. passed the Preliminary Examination for a Student in Surveying, 1898.
1	131	66	.....	6	11	2	5	5	.....	1	7	.....	1	.....
2	108	141	.....	23	6	3	2	.....	.....	.....	.....	.....	.....	.....
3	148	168	1	7	8	4	6	1	.....	5	10	.....	.....	.....
4	.....	.....	.....	18	8	6	3	.....	2	3	2	.....	.....	.....
5	.....	.....	.....	18	22	2	18	18	.....	15	1	.....	.....	.....
6	83	113	.....	6	17	1	17	.....	.....	2	2	.....	.....	.....
7	79	77	.....	10	5	2	5	.....	.....	.....	.....	.....	.....	.....
8	.....	.....	.....	10	7	2	2	2	.....	.....	1	.....	.....	.....
9	118	103	.....	16	15	4	12	1	.....	1	2	.....	.....	.....
10	82	93	.....	10	5	.....	3	.....	.....	.....	.....	.....	.....	.....
11	224	106	.....	13	14	4	19	19	.....	.....	4	.....	.....	.....
12	665	665	.....	2	16	25	23	4	1	4	16	.....	20	3
13	73	82	.....	5	8	.....	2	.....	.....	1	3	.....	.....	.....
14	.....	.....	.....	4	10	3	11	9	.....	.....	.....	.....	.....	.....
15	107	150	36	13	15	1	10	.....	1	2	.....	.....	.....	.....
16	978	978	.....	47	41	55	36	2	.....	17	6	.....	.....	.....
17	202	102	.....	17	11	3	7	12	.....	1	.....	.....	1	.....
18	205	205	.....	13	4	1	2	.....	.....	.....	2	.....	.....	.....
19	221	221	5	.....	1	3	2	1	.....	3	4	1	.....	.....
20	146	248	.....	10	2	4	7	10	.....	3	10	1	1	.....
21	210	.....	.....	37	32	6	16	1	1	7	7	1	2	.....
22	203	80	.....	15	13	1	1	.....	.....	.....	.....	.....	.....	.....
23	270	140	.....	20	.....	.....	3	.....	.....	7	8	.....	.....	.....
24	200	108	.....	11	17	1	6	6	.....	2	3	.....	4	.....
25	133	104	.....	8	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
26	105	99	.....	.....	.....	5	1	.....	.....	.....	2	.....	1	.....
27	142	.....	.....	15	16	3	5	.....	.....	2	1	.....	.....	.....
28	110	80	.....	17	15	.....	1	2	.....	1	3	.....	.....	.....
29	163	129	.....	2	9	3	10	8	3	14	7	1	2	.....
30	97	83	.....	17	14	4	17	2	1	4	5	.....	1	.....
31	190	189	.....	26	23	3	4	.....	.....	3	3	.....	.....	.....
32	242	230	2	3	16	2	27	8	.....	12	21	.....	.....	.....
33	160	158	.....	5	10	3	7	2	.....	7	8	.....	.....	.....
34	194	403	.....	3	18	.....	15	16	.....	8	9	4	10	4
35	160	160	.....	8	6	1	3	4	.....	.....	7	.....	.....	.....
36	133	140	.....	9	7	3	7	1	.....	.....	2	.....	.....	.....
37	328	164	.....	25	22	5	8	.....	.....	2	14	.....	.....	.....
1	6,610	5,785	39	469	450	165	340	139	9	123	175	8	43	7
2	7,162	5,939	9	560	865	333	270	128	8	151	178	9	35	7
3	.....	.....	30	.....	.....	.....	70	11	1	.....	.....	.....	8	.....
4	552	154	.....	91	415	168	.....	.....	.....	28	3	1	.....	.....
	57	49	¼	4	4	1½	3	1¼	.....	1	1½	.....	½	.....

IX.—TABLE I.—The

High Schools.	Number of pupils in the different branches of										
	Zoology.	Latin.	Greek.	French.	German.	Writing.	Bookkeeping and Commercial Transactions.	Stenography.	Drawing.	Vocal Music.	Drill.
1 Alexandria		123	22	123	21	46	46		46		53
2 Almonte		119	16	82	33	59	94		101		
3 Arnprior		100	7	61	15	76	76		76		
4 Arthur		66		14	7	52	52	31	52		118
5 Athens		174	26	97	22	71	70		70		
6 Aurora		85	3	85	10	69	69		69		95
7 Beamsville		70	1	59	7	42	42		42		
8 Belleville	3	253	2	230	141	135	135		135		114
9 Berlin		114	6	54	137	43	79	21	98		70
10 Bowmanville	3	128	6	84	55	63	63		63		30
11 Bradford		67		63	13	71	71	40	71		53
12 Brampton	2	182	18	150	71	69	80		80		
13 Brighton		62		30	6	35	35		35		
14 Caledonia		139	5	15	4	71	71		71		
15 Campbellford	7	110		85	30	67	67		67		
16 Carleton Place		170	20	130	34	46	90		90		
17 Cayuga		85	5	55	4	35	35		35		53
18 Colborne		62		30	45	24	24		24		
19 Cornwall		184	10	164	112	85	85		85		
20 Deseronto		105	1	57	24	71	45		71		101
21 Dundas		125	4	120	10	114	114		114		65
22 Dunnville		67	7	57	48	69	69	8	53		54
23 Dutton		81		31	17	21	21		21		38
24 Elora		79		68	42	29	49	19	46		
25 Essex	2	96	4	43	27	32	34		34		98
26 Fergus		149	55	10	20	48	48		48		
27 Forest		90	2	35	30	26	26		26		
28 Gananoque		119	1	81	76	78	75		78		139
29 Georgetown		106	4	91	25	35	38		38		62
30 Glencoe	3	86	8	60	24	51	51		51		40
31 Gravenhurst		13		14	7	33	37		33		
32 Grimsby		66	1	40	39	29	29		29		
33 Hagarsville		91	2	62	36	45	45		45		51
34 Harriston	5	140	6	121	19	36	34		36		
35 Hawkesbury		63		38	10	26	26		26		64
36 Iroquois	2	133	1	86	78	71	71	15	71		
37 Kemptville	2	178	10	151	45	62	62		62		
38 Kincardine		115	26	114	51	53	53		53		106
39 Leamington	1	100	1	67	42	73	70		70		
40 Listowel		142	3	98	74	65	65		65		85
41 Lucan	1	110		38	7	38	37		37		
42 Madoc		60		20		28	28		28		
43 Markham	3	193	11	175	26	52	52		106		
44 Meaford		135	3	62	25	49	49	40	49		140
45 Mitchell		54	1	31	48	64	64		64		51
46 Mount Forest		118	1	76	15	93	93		93		84
47 Newburgh		80	2	53	30	70	70		70		
48 Newcastle		43		30	15	22			22		
49 Newmarket		78	4	61	40	37	39		37		90
50 Niagara		25		16	2	31	31		31		
51 Niagara Falls South		85	2	40	45	70	70		70		50
52 Norwood		125		47	5	70	70		54		30

High Schools.

	Instruction.		Examinations, etc.												
	Calisthenics	Gymnastics.	How many pupils obtained Commercial Diplomas in 1898?	No. passed Primary Examination.	No passed Junior Leaving Examination.	No. passed Senior Leaving Examination.	No. passed Departmental Matriculation Examination.	No. passed the Junior Matriculation at any University.	No. passed the Senior Matriculation at any University.	No. 1st Class Matriculation Honors.	No. 2nd Class Matriculation Honors.	No. passed Matriculation Examination, Law Society, 1898.	No. passed Matriculation Examination, Medical Council, 1898.	No passed the Preliminary Examination for a Student in Surveying, 1898.
1	70			18	11		5							
2				3	8	1	2							
3				5	1									
4	118			11	6									
5				25	21		11	3						
6	41			4	5		1	2		3				
7				4	3									
8				6	7	2	3							
9	54			4	8					1	2			
10				7	5	2	2	1		1	6		1	
11				1	5		6				6			
12				15	10	2	6	1			6			
13				8	2		1	1						
14				10	6	1	3	1			1			
15				7	8	2	5							
16				5	6			2						
17				2	3		1							
18				8	6		2							
19				12	5		3							
20	101						1			2	4			
21	67			1	7		2							
22	20			4	5	1	1							
23				3	6									
24				3										
25	98	48		12	6		2			2	4			
26				2	8	2	1	4						
27				5	4		3							
28	139			12	2		4	3						
29	47			5	12	1	1	2			1			
30	105			8	4	1	2		1	2	2			
31				3	2		1	1						
32				3	1		1	1						
33				6	8		5							
34				16	5	4	9							
35	10	64		2										
36				13	5	1								
37				22	12	2	7	1					9	
38	106			8	5				1					
39				14	7		4							
40	56	85		8	4		1							
41				6	11									
42				12	6									
43				18	12	2	4			2	2			1
44	140	77	27	9	2		7	8	1			1	3	
45	49	51		10	7	2	1						1	
46	76			7	11		4							
47				9	2		1							
48	17				5		5							
49	90	52			11		7	6						
50				2										
51	32		14		2		1							
52	20		18	10	10		2	1						

IX.—TABLE I.—The

	High Schools.	Number of pupils in the different branches of										
		Zoology.	Latin.	Greek.	French.	German.	Writing.	Bookkeeping and Commercial Transactions.	Stenography.	Drawing.	Vocal Music.	Drill.
3	Oakville	.....	50	4	9	.....	35	35	.....	35	.....	.....
54	Omemee	.....	55	2	53	14	20	20	.....	20	.....	27
55	Orangeville	5	197	14	94	49	38	38	.....	38	.....	.....
56	Orillia	3	184	10	103	68	92	92	.....	92	.....	218
57	Oshawa	.....	148	22	70	78	65	116	.....	115	.....	.....
58	Paris	.....	95	.....	49	15	56	56	.....	56	.....	.....
59	Parkhill	.....	85	5	20	8	35	35	.....	35	.....	.....
60	Pembroke	.....	157	5	99	57	73	104	19	104	.....	.....
61	Petrolea	.....	154	64	90	25	82	82	82	82	.....	74
62	Picton	4	199	5	208	112	194	194	20	194	.....	.....
63	Port Arthur	.....	90	1	53	48	45	45	.....	45	.....	.....
64	" Dover	.....	65	4	19	8	48	49	.....	49	.....	.....
65	" Elgin	.....	109	3	109	60	57	57	.....	57	.....	60
66	" Hope	.....	189	12	151	146	92	92	85	92	.....	.....
67	" Perry	.....	125	12	64	48	58	50	25	58	.....	67
68	" Rowan	.....	30	.....	23	13	14	14	.....	14	.....	.....
69	Prescott	.....	64	1	49	22	39	39	.....	39	.....	.....
70	Renfrew	.....	170	41	179	21	95	95	.....	61	.....	89
71	Richmond Hill	.....	95	31	99	2	43	43	.....	43	.....	53
72	Simcoe	.....	150	15	90	30	79	79	.....	79	.....	39
73	Smith's Falls	1	134	3	105	91	94	94	.....	94	.....	.....
74	Smithville	.....	80	1	16	6	43	43	.....	43	.....	.....
75	Stirling	3	54	5	....	.....	16	16	.....	16	....	.....
76	Streetsville	.....	68	1	36	7	40	40	.....	40	.....	.....
77	Sydenham	.....	105	.....	63	34	38	42	.....	42	.....	.....
78	Thorold	.....	89	6	80	36	43	43	.....	43	.....	77
79	Tilsonburg	.....	54	.....	36	12	53	53	12	53	.....	.....
80	Toronto Junction	3	219	11	152	74	125	125	.....	134	.....	.....
81	Trenton	.....	124	.....	77	46	51	49	.....	51	.....	.....
82	Uxbridge	.....	97	2	87	43	23	57	.....	57	.....	57
83	Vankleekhill	.....	166	4	140	43	72	89	.....	89	.....	.....
84	Vienna	.....	30	2	22	2	7	7	.....	7	.....	18
85	Walkerton	.....	156	10	83	78	55	90	.....	92	.....	54
86	Wardsville	.....	51	3	34	32	17	17	.....	17	.....	25
87	Waterdown	.....	49	.....	12	1	34	34	.....	2	.....	.....
88	Waterford	.....	50	.....	32	14	37	37	.....	37	.....	.....
89	Watford	.....	123	.....	18	5	44	44	.....	44	.....	57
90	Welland	.....	130	12	119	31	23	65	.....	66	.....	.....
91	Weston	.....	56	.....	8	2	43	43	1	43	.....	33
92	Wiarton	.....	74	3	28	13	45	45	.....	45	.....	.....
93	Williamstown	.....	55	....	48	44	55	55	.....	55	.....	.....
1	Total, 1898	53	9,918	621	6,534	3,207	5,067	5,374	418	5,419	.....	2,882
2	" 1897	74	8,919	550	6,308	2,300	5,498	5,995	454	6,108	130	3,520
3	Increase	.....	999	71	226	907	.....	.....	.....	.....	.....	.....
	Decrease	21	.....	.....	.....	.....	431	621	36	689	130	638
5	Percentage	½	85	5	56	28	43	46	4	46	.....	25

High Schools.

	Instruction.		Examinations, etc.												
	Calisthenics.	Gymnastics.	How many pupils obtained Commercial Diplomas in 1898?	No. passed Primary Examination.	No. passed Junior Leaving Examination.	No. passed Senior Leaving Examination.	No. passed Departmental Matriculation Examination.	No. passed the Junior Matriculation at any University.	No. passed the Senior Matriculation at any University.	No. 1st Class Matriculation Honors.	No. 2nd Class Matriculation Honors.	No. passed Matriculation Examination, Law Society, 1898.	No. passed Matriculation Examination, Medical Council, 1898.	No. passed the Preliminary Examination for a Student in Surveying 1898.
53				6	7		1							
54	28			5	3			1						
55				16	11	1	6	3	3					
56	218	218		6	26	4	4		1	2	4		1	
57				1	6		7							
58				3	3		2							
59		50		10	3		1							
60				6	4		4	9		2	1			1
61				19	7		2	2						
62				13	9	2	10		1					
63				4	1		2	1						
64				2	2		1							
65	48			14	14		15							
66				4	14	1	11			2	5			
67	62	130		13	8		3		1	3	1		2	
68				2										
69				6	6		3				1			
70				4	4	1	8	2		1			1	
71	46			6	5		4							1
72	40			8	10	3	6	1				2		
73				13	5	1	5							
74				7	1									
75				7	4	1								
76				2	1									
77				14	6		8	1		1	1			
78	77			5	2		1							
79														
80				14	14		5						1	1
81				7	2		3							
82	55			7	8	1								
83				15	14		14		2					
84	12	18												
85	58			25	15	3	3							
86	26			1	2									
87				3	1									
88				3	3									
89	80			16	14			1			2			
90				8	2	1	3	1						
91	63			3	3		1	1						
92				9	3		4	4						
93				4	2			1						
1	2,269	793	59	699	553	45	265	73	11	24	43	3	19	4
2	2,989	804	221	792	859	99	197	41	8	22	34	4	12	5
3							68	32	3	2	9		7	
4	720	11	162	93	306	54						1		1
5	19	7	½	6	5	½	2	½						

X.—TABLE K.—The

Collegiate Institutes.	Brick, stone or frame school house.	Size of playground.	Schools under United Board.	Value of library.	Value of scientific apparatus.	Value of charts, maps and globes.	Gymnasium.	Value of gymnasium and appliances.	Miscellaneous: Museum.	Miscellaneous: Estimated value of museum.	Schools using authorized Scripture readings.	Schools opened and closed with prayer.	Schools using Bible.	Religious instruction imparted.
		acres.		$	$	$		$						
1 Aylmer	B	4¼	.....	609	713	125	1	766	1	300	....	1	...	....
2 Barrie	B	3	.....	612	640	118	1	1,820	..	.....	....	1	....	.. .
3 Brantford	B	½	.....	602	675	108	1	1,129	..	.....	....	1	1	....
4 Brockville	S	2	.....	710	942	179	....	299	..	.....	....	1	....	....
5 Chatham	B	2	.....	650	650	167	1	734	1	50	1	1	1	....
6 Clinton	B	3¼	.....	626	779	150	1	831	1	10	1	1	1	....
7 Cobourg	B	1	.....	611	599	110	1	888	..	.....	1	1	....	....
8 Collingwood	B	⅛	.....	602	641	76	1	156	..	....	1	1	....	....
9 Galt	S	8⅔	.....	1,017	822	175	1	1,304	1	27	1	1	....	....
10 Goderich	B	¼	.....	637	658	72	1	2,700	..	... ..	1	1	....	....
11 Guelph	S	4	1	890	758	145	1	2,832	1	50	....	1	....	....
12 Hamilton	B	½	1	964	1,479	188	1	640	1	50	1	1	1	....
13 Ingersoll	B	2	1	550	623	122	1	952	..	.....	1	1	....	....
14 Kingston	B	2	1	991	806	81	....	.....	1	100	1	1	1	....
15 Lindsay	B	2	1	1 038	889	133	1	726	..	.....	.. ..	1	....	....
16 London	B	3	1	1,010	2 504	169	1	1.098	1	700	1	1	....	....
17 Morrisburg	B	1	1	611	1,186	130	1	1,168	1	75	1	1	....	....
18 Napanee	B	3⅓	1	836	825	112	1	1,036	1	25	1	1	1	....
19 Niagara Falls	B	5⅔	.....	702	617	87	1	1,119	..	.....	....	1	1	....
20 Ottawa	S	1½	.....	959	1,492	210	1	2,224	1	100	1	1	1	....
21 Owen Sound	B	3	1	1,276	1,601	114	....	91	1	50	....	1	....	....
22 Perth	B	5	1	714	716	155	1	827	1	500	1	1	....	....
23 Peterborough	B	2	1	687	866	149	1	760	..	.....	....	1	....	.. .
24 Ridgetown	B	1¾	.....	615	968	138	1	996	1	25	....	1	...	....
25 Sarnia	B	2	1	717	672	102	1	1,518	..	.....	1	1	....	....
26 Seaforth	B	2¾	.....	722	614	155	1	750	1	60	1	1	1	....
27 Stratford	B	5	.....	810	1,096	201	1	117	..	.....	....	1	....	....
28 Strathroy	B	1½	.....	753	878	114	1	494	..	.....	1	1	....	....
29 St. Catharines	B	½	.....	631	714	135	1	775	1	35	1	1	....	....
30 St. Mary's	B	2	....	576	394	113	1	760	..	.....	1	1	....	....
31 St. Thomas	B	2½	1	871	905	100	1	974	..	.....	..	1	....	....
32 Toronto (Harbord)	B	1⅓	.....	1,024	1,995	156	1	4,710	..	.....	....	1	....	....
33 " (Jameson)	B	1½	.....	1,460	2.046	144	1	4,790	..	.....	1	1	1	....
34 " (Jarvis)	B	2	.....	1,212	1,631	406	1	8.900	1	20	1	1	1	....
35 Whitby	B	½	1	615	505	94	1	1,100	..	.....	1	1	1	....
36 Windsor	B	2	1	698	947	114	1	3,200	1	200	. ..	....	....	....
37 Woodstock	B	1	.....	2,088	1,324	146	1	2,172	1	75	1	1	....	....
	B. S.	acres.												
1 Total, 1898	33 4	86	15	29,696	36,170	5,193	34	55,356	19	2,452	23	36	12	....
2 " 1897	33 4	89½	15	28,406	35,736	5,080	34	55,573	15	1,683	22	36	11	1
3 Increase	.. ..	.. ...	.....	1,290	434	113	....	.....	4	769	1	....	1	....
4 Decrease	.. ...	3½	.....	.....	....	....	....	217	..	.....	...	....	....	....
5 Percentage	89 11	.....	41	.....	....	....	89	.....	51	.....	62	100	33	....

Collegiate Institutes.

information.

Commencement exercises.		No. of pupils in—				No. of pupils from municipalities composing the High School district.	From other municipalities within the county.	From other counties.	Who entered mercantile life.	Who became occupied with agriculture.	Who joined a learned profession.	Who became teachers.	Who left for other occupations.	Occupation of parents.			
		Form I.	Form II.	Form III.	Form IV.									Commercial.	Agricultural.	Mechanical.	Professional.
1	1	52	38	41	12	90	51	2	3	4	5	4	16	40	53	35	15
2	..	68	123	58	12	122	127	12	14	1	4	12	1	51	128	45	37
3	1	99	142	77	18	253	75	8	21	3	2	12	13	112	70	111	43
4	1	160	94	46	31	250	77	4	10	5	4	12	....	70	131	100	30
5	1	156	116	57	20	255	90	4	25	10	5	25	20	132	73	76	68
6	1	80	53	66	14	102	105	6	8	8	7	24	12	45	90	48	30
7	..	104	18	26	8	107	49	....	15	5	3	20	25	25	100	6	25
8	1	47	48	90	10	113	54	28	6	9	3	14	20	58	71	50	16
9	1	149	45	42	20	139	96	21	11	4	6	13	23	47	88	91	30
10	1	90	51	57	17	147	61	7	4	4	2	10	25	64	70	50	31
11	1	114	62	58	29	216	31	16	8	6	6	13	29	118	45	57	43
12	1	252	171	207	140	627	86	57	60	16	20	50	45	327	97	252	94
13	1	86	27	27	15	95	53	7	8	2	2	6	36	48	53	33	21
14	..	302	104	91	10	422	72	13	27	11	8	20	86	147	57	218	85
15	1	79	95	79	12	170	80	15	28	19	13	19	29	89	83	51	42
16	1	551	222	170	84	826	176	25	98	50	45	50	60	363	336	240	88
17	1	73	63	60	25	101	119	1	13	7	2	29	20	19	156	26	20
18	1	119	52	36	13	106	102	12	13	5	6	12	31	58	94	38	30
19	1	109	71	41	22	122	93	28	22	4	4	15	26	109	64	50	20
20	1	235	88	71	30	337	65	22	26	11	4	10	31	201	73	92	58
21	1	111	99	128	47	210	118	57	26	20	14	60	26	67	120	160	38
22	1	102	68	34	13	76	135	6	10	13	4	21	6	26	133	41	17
23	..	143	60	50	23	240	34	2	15	....	....	..	....	63	51	102	60
24	1	74	66	43	26	86	120	3	10	16	8	10	8	79	80	34	16
25	1	149	61	40	9	167	87	5	8	7	2	4	48	52	48	115	44
26	1	87	60	46	11	105	96	3	8	17	6	13	3	53	111	27	13
27	1	108	90	69	25	229	56	7	26	4	3	14	40	122	53	89	28
28	1	60	76	45	26	110	93	4	10	30	5	15	25	41	112	40	14
29	..	189	66	37	26	224	75	19	20	24	17	22	18	86	95	110	27
30	1	41	90	38	32	117	42	42	15	10	4	20	18	53	92	41	15
31	..	227	64	58	30	295	84	....	60	30	10	5	24	165	82	114	18
32	1	100	204	145	62	499	4	8	38	.....	.....	20	....	241	112	61	97
33	1	113	140	80	41	359	9	6	30	3	5	12	95	152	35	125	62
34	..	109	183	117	31	440	.....	....	90	5	22	45	48	256	9	87	88
35	1	83	41	30	13	101	60	6	3	6	1	10	8	20	122	15	10
36	1	164	85	32	13	216	69	9	20	7	5	9	37	110	52	116	16
37	1	114	76	98	40	196	118	14	16	20	5	24	40	105	112	67	44
1	30	4,899	3,212	2,490	1,010	8,270	2,862	479	825	396	262	674	992	3,814	3,351	3,013	1,433
2	31	5,283	3,288	2,507	1,130	8,552	3,062	594	779	483	244	986	1,065	4,126	3,236	3,352	1,494
3	..	.....	.....	.....	.....	.....	.....	.....	46	....	18	.....	.....	.....	115	.....	.....
4	1	384	76	17	120	282	200	115	...	87	....	312	73	312	.....	339	61
5	82	42	28	21	9	71	25	4	....	....	....	....	.....	33	29	25	13

X.—TABLE K.—The

High Schools.	Miscellaneous														
	Brick, stone or frame school house.	Size of playground.	School under United Board.	Value of library.	Value of scientific apparatus.	Value of charts, maps and globes.	Gymnasium.	Value of gymnasium and appliances.	Museum.	Estimate value of museum.	Schools using authorized Scripture readings.	Schools opened and closed with prayer.	Schools using Bible.	Religious instruction imparted.
		acres.		$	$	$		$		$				
1 Alexandria	B	1¼		156	179	85						1		
2 Almonte	S	1	1	850	381	80		8	1	20		1	1	
3 Arnprior	B	1¾	1	229	324	52		33				1		
4 Arthur	B	2½		237	480	27		6				1		
5 Athens	S	2		440	399	54		4			1	1		
6 Aurora	B	3		338	404	60						1	1	
7 Beamsville	B	2	1	280	216	38			1	15		1		
8 Belleville	B	1½	1	321	507	183						1	1	
9 Berlin	B	4		393	864	43		4	1	50		1	1	
10 Bowmanville	B	2		565	451	60					1	1	1	
11 Bradford	B	3		257	341	20		23		5		1	1	
12 Brampton	B	5		435	572	56		10	1	10		1		
13 Brighton	B	⅔	1	270	303	32					1	1		
14 Caledonia	B	1¾	1	417	513	52						1		
15 Campbellford	B	¾	1	280	426	33					1	1		
16 Carleton Place	S	1	1	623	341	53		3				1		
17 Cayuga	B	1½		155	356	33						1		
18 Colborne	B	¾	1	221	220	80					1	1		
19 Cornwall	B	1⅛		446	501	158					1	1		
20 Deseronto	B	3½		303	353	55	1	510	1	50				
21 Dundas	B	3	1	396	469	96		39				1	1	
22 Dunnville	B	¼		347	486	56						1		
23 Dutton	B	1		216	475	32						1		
24 Elora	S	½		166	299	71					1	1		
25 Essex	B	3¼		310	425	84	1	826			1	1		
26 Fergus	S	¾	1	214	230	65						1		
27 Forest	B	2		273	385	62						1	1	
28 Gananoque	B	1	1	481	410	80		11			1	1		
29 Georgetown	B	4		198	346	63						1		
30 Glencoe	B	2		330	576	55						1	1	
31 Gravenhurst	B	7½		171	357	46						1		
32 Grimsby	F	1		163	207	21					1	1		
33 Hagarsville	B	1½		306	427	32					1	1	1	
34 Harriston	B	3½		153	360	60						1		
35 Hawkesbury	B	1	1	330	334	46					1	1		
36 Iroquois	B	1¼		571	1,047	127		25	1	325	1	1	1	
37 Kemptville	B	2	1	300	353	68		19				1		
38 Kincardine	B	4	1	500	627	90		17			1	1	1	
39 Leamington	B	1¼		254	402	120		10			1	1		
40 Listowel	B	2		331	365	65	1	296				1		
41 Lucan	B	3		249	537	62						1		
42 Madoc	B	1		168	388	80					1	1	1	
43 Markham	B	2¼		225	723	46		33			1	1	1	
44 Meaford	B	3		260	516	49	1	1,419			1	1		
45 Mitchell	B	¾		225	299	64	1	536		3		1		
46 Mount Forest	B	2½		384	515	38					1	1		
47 Newburgh	S	2	1	413	278	47						1		
48 Newcastle	B	2	1	156	276	46					1	1		
49 Newmarket	B	2		146	344	59	1	413				1	1	
50 Niagara	B	½		183	149	58			1	15	1	1	1	
51 Niagara Falls, S.	B	2		239	252	41		30				1	1	
52 Norwood	B	8	1	328	296	18						1	1	
53 Oakville	B	⅔	1	260	236	24					1	1		
54 Omemee	F	1½	1	220	167	16		3				1		
55 Orangeville	B	2½		517	505	52						1		
56 Orillia	B	2½										1	1	
57 Oshawa	B	3	1	372	257	134			1	50	1	1		
58 Paris	B	4	1	272	539	103					1	1		

High Schools.

information.

Commencement exercises.	Number of pupils in—				No. of pupils from municipalities composing the High School district.	From other municipalities within the county.	From other counties.	Who entered mercantile life.	Who became occupied with agriculture.	Who joined a learned profession.	Who became teachers.	Who left for other occupations.	Occupation of parents.			
	Form I.	Form II.	Form III.	Form IV.									Commercial.	Agricultural.	Mechanical.	Professional.
1 ..	35	42	46	....	109	10	4	1	7	2	11	11	10	81	25	7
2 ..	80	36	19	8	100	28	15	11	5	1	8	15	26	63	48	6
3 ..	58	49	15	....	101	13	8	5	5	....	3	17	68	20	30	4
4 1	52	40	20	6	110	7	1	11	5	1	4	2	26	65	25	2
5 1	48	70	70	....	77	110	1	8	10	8	20	12	49	100	27	12
6 1	37	32	22	4	61	33	1	7	6	2	6	12	24	35	20	16
7 ..	34	25	14	....	68	5	....	4	4	....	3	5	13	34	20	6
8 1	135	84	54	9	231	49	2	30	8	13	17	23	71	132	61	18
9 1	76	43	31	4	84	66	4	10	3	2	8	11	65	28	35	26
10 1	63	50	24	15	90	61	1	9	4	5	7	25	17	93	32	10
11 1	33	61	19	....	54	56	3	7	12	2	6	15	14	88	7	4
12 1	71	50	51	18	86	98	6	8	6	5	12	8	38	102	40	10
13 1	35	18	13	....	48	18	....	4	12	2	3	5	19	17	24	6
14 1	46	52	43	....	60	46	35	1	9	2	6	25	12	71	48	10
15 1	41	42	30	18	75	50	6	7	5	3	10	15	14	89	25	3
16 ..	90	46	42	2	143	29	8	12	8	2	6	7	41	46	84	9
17 1	29	35	19	6	29	58	2	2	4	1	11	4	9	56	19	5
18 ..	24	27	24	....	44	31	....	4	3	2	8	10	9	50	12	4
19 1	70	166	24	....	136	56	8	10	8	6	30	20	20	109	65	6
20 ..	49	45	19	6	88	20	11	10	3	2	5	15	31	31	50	7
21 1	60	42	29	1	82	47	3	10	4	3	4	5	45	33	41	13
22 ..	55	42	24	9	69	54	7	7	6	1	5	12	36	55	28	11
23 ..	21	43	24	3	47	42	2	....	1	....	2	8	10	46	27	8
24 ..	29	40	24	6	50	47	2	2	3	....	.....	2	13	60	13	13
25 1	32	39	23	12	47	53	6	5	1	....	5	2	26	50	19	11
26 ..	48	47	45	9	100	49	...	15	5	10	20	5	40	59	33	17
27 ..	26	34	34	....	38	55	1	5	5	2	9	23	17	54	17	6
28 1	59	49	31	....	103	18	18	7	2	5	5	16	49	39	34	17
29 ..	25	42	39	13	41	52	26	6	6	....	9	5	31	45	29	14
30 1	38	30	23	14	44	56	5	2	3	3	9	2	15	68	20	;
31 ..	33	18	6	3	48	10	2	6	1	2	2	6	20	6	26	;
32 1	29	37	7	....	36	31	6	4	3	....	1	12	6	35	23	9
33 1	30	26	43	1	41	56	3	7	10	7	8	8	30	45	17	8
34 ..	23	41	61	19	62	48	34	10	14	3	15	16	36	58	32	18
35 1	26	28	10	....	27	36	1	2	3	....	1	6	16	25	21	2
36 1	53	47	32	9	42	78	21	7	2	3	5	22	28	83	22	8
37 .	37	76	58	20	71	59	61	6	4	3	35	.....	50	61	50	30
38 1	32	43	32	20	62	62	3	9	11	2	11	11	36	67	18	6
39 1	73	29	21	4	60	54	13	3	8	3	3	7	24	55	39	9
40 1	58	39	50	....	85	49	13	15	3	20	5	10	20	50	67	10
41 1	41	38	31	2	36	72	4	4	6	....	12	3	21	76	8	7
42 ..	28	31	25	....	38	45	1	5	6	1	10	4	10	48	18	8
43 1	52	65	67	19	51	135	17	8	15	8	11	9	38	128	19	18
44 1	32	53	46	21	66	74	12	3	12	6	16	19	22	70	42	18
45 1	40	35	25	6	73	31	2	3	8	1	5	9	25	39	32	10
46 1	57	51	39	7	99	23	32	8	5	4	11	9	47	51	33	23
47 1	70	47	20	....	44	93	....	20	35	5	10	15	20	80	30	7
48 ..	17	18	7	1	18	23	2	3	2	....	2	4	6	24	10	3
49 ..	23	37	34	....	47	42	5	7	5	2	7	15	14	43	26	11
50 ..	31	13	6	...	29	21	....	....	1	2	2	.....	12	18	12	8
51 ..	57	47	19	....	115	6	2	6	10	....	3	25	20	56	44	3
52 ..	54	31	40	....	63	50	12	6	12	4	5	6	22	73	20	10
53 1	22	20	25	....	40	19	8	4	2	....	8	3	16	26	19	6
54 ..	20	21	14	....	45	9	1	....	2	....	9	4	7	24	20	4
55 1	30	75	100	17	89	77	56	11	20	7	19	30	44	118	31	29
56 ..	57	78	77	14	138	67	21	12	10	3	25	42	40	96	65	25
57 1	117	54	21	10	135	61	6	16	9	....	2	22	34	58	98	12
58 1	56	28	21	....	82	21	2	19	6	4	1	14	36	28	34	7

X.—TABLE K.—The

High Schools.	Brick, stone or frame school house.	Size of playground.	Schools under United Board.	Value of library.	Value of scientific apparatus.	Value of charts, maps and globes.	Gymnasium.	Value of gymnasium and appliances.	Museum.	Estimated value of museum.	Miscellaneous: Schools using authorized Scripture readings.	Schools opened and closed with prayer.	Schools using Bible.	Religious instruction imparted.
		acres.		$	$	$		$		$				
59 Parkhill	B	2½	1	303	436	93	....	44	1	50	....	1	....	....
60 Pembroke	B	¾	1	269	354	92	....	....	..	.....	....	1	....	....
61 Petrolea	B	2⅛	.....	369	359	45	....	.....	..	.....	1	1	....	....
62 Picton	B	2¾	.....	469	550	108	....	.....	.	....	...	1	....	....
63 Port Arthur	B	¾	.....	88	288	48	....	.....	1	20	....	1	....	...
64 " Dover	B	2	1	191	378	19	....	.....	1	18	1	1	....	....
65 " Elgin	B	1¼	.....	241	363	43	....	55	..	.....	....	1	1	....
66 " Hope	B	1	.....	445	436	72	....	....	1	8	1	1	....	....
67 " Perry	B	1¾	1	267	433	52	....	....	1	10	....	1	....	....
68 " Rowan	B	2	1	87	182	22	....	.....	1	8	1	1	....	....
69 Prescott	B	1⅛	1	215	322	109	...	23	..	....	....	1	....	....
70 Renfrew	B	3⅛	1	172	293	33	....	.....	..	.....	1	1	.	....
71 Richmond Hill	B	¾	1	78	258	31	....	28	..	.....	1	1	....	1
72 Simcoe	B	3	1	267	688	134	....	14	.	.....	1	1	1	....
73 Smiths Falls	B	¾	1	474	495	68	...	20	1	5	....	1	...	....
74 Smithville	B	1	.....	81	255	36	....	.....	..	....	1	1	....	....
75 Stirling	B	1	1	166	243	33	....	.....	..	.....	....	1	1	....
76 Streetsville	B	¼	.....	203	271	45	....	.....	..	.....	....	1	1	....
77 Sydenham	S	1	.....	327	279	31	....	.....	..	....	....	1	....	....
78 Thorold	B	2½	.....	265	335	102	....	4	..	.....	....	1	1	1
79 Tilsonburg	B	3	.....	148	530	69	....	.....	..	....	....	1	1	....
80 Toronto Junction	B	1	. ..	453	494	79	....	.....	..	.....	....	1	...	....
81 Trenton	B	1¼	1	342	350	73	....	....	..	.....	1	1	....	....
82 Uxbridge	B	⅝	1	298	362	53	....	.....	..	.....	1	1	....	....
83 Vankleekhill	B	2½	.....	437	585	37	....	20	..	. .	....	1	....	....
84 Vienna	B	5	1	275	252	105	1	560	1	18	1	1	....	....
85 Walkerton	F	1¼	.....	301	458	62	....	10	..	.....	1	....	....	....
86 Wardsville	B	2	1	205	156	96	....	.. ..	..	.....	...	1	...	....
87 Waterdown	S	3¼	1	189	318	37	....	.....	..	.....	....	1	....	....
88 Waterford	B	3	.....	317	436	47	....	.....	..	.....	1	1	1	....
89 Watford	B	2	.....	320	361	109	....	20	..	.....	....	1	..	....
90 Welland	B	1	.....	133	472	23	....	.....	..	.....	....	1	1	....
91 Weston	B	½	...	274	425	69	....	.....	..	.....	....	1	1	....
92 Wiarton	S	1½	.....	303	245	45	....	.....	..	.....	....	1	1	....
93 Williamstown	B	½	1	170	196	38	.. .	.....	..	....	....	1	....	....
	B S F													
1 Total, 1898	80 9 3	186	39	26,976	35,826	5,718	7	5 076	16	680	37	91	29	2
2 " 1897	82 9 2	185	39	26,612	34,278	5,545	10	6,731	15	795	40	90	31	3
3 Increase	1	1	.....	364	1,548	173	....	.....	1	.....	....	1	....	....
4 Decrease	2	.....	.....	.....	.....	.....	3	655	.	115	3	....	2	1
5 Percentage	87 10 3	.....	42	.....	.....	.....	8	.....	18	.....	40	99	32	....

High Schools.

information.

Commencement exercises.		Number of pupils in—				No. of pupils from municipalities composing the High School district.	From other municipalities within the county.	From other counties.	Who entered mercantile life.	Who became occupied with agriculture.	Who joined a learned profession.	Who became teachers.	Who left for other occupations.	Occupation of parents.			
		Form I.	Form II.	Form III.	Form IV.									Commercial.	Agricultural.	Mechanical.	Professional.
59	1	25	33	35	2	44	47	4	4	2	3	8	7	33	51	5	6
60	..	104	49	29	1	145	34	4	16	1	6	7	20	66	31	60	26
61	..	99	66	25	3	121	71	1	12	9	....	8	25	54	55	69	15
62	1	132	62	54	13	147	112	2	10	15	....	16	.....	74	128	34	25
63	1	45	41	12	....	66	32	....	6	....	1	6	14	30	31	30	7
64	1	48	24	18	....	52	29	9	3	2	...	2	4	11	61	11	7
65	1	46	27	38	....	64	46	1	9	2	1	11	16	26	38	34	13
66	1	92	35	44	26	109	85	3	10	11	4	7	25	58	84	42	13
67	1	36	44	40	15	63	57	15	5	8	6	15	7	29	60	29	17
68	..	8	21	10	....	15	23	1	4	3	....	1	3	6	24	5	4
69	1	39	40	13	6	76	22	....	3	4	2	5	4	8	16	67	7
70	1	61	92	40	11	130	69	5	25	7	2	8	4	40	107	38	19
71	1	43	24	29	3	17	81	1	5	6	1	2	8	13	63	16	7
72	1	79	56	36	12	82	99	2	25	30	4	25	20	47	87	32	17
73	1	63	49	40	1	91	32	30	15	10	3	10	15	20	39	81	13
74	..	43	23	16	....	50	28	4	...	1	....	2	7	4	62	8	8
75	.	16	32	13	5	35	31	....	7	2	2	7	6	7	35	16	8
76	1	29	28	12	....	30	29	10	3	5	...	2	3	12	32	21	4
77	..	38	71	30	4	72	65	6	2	27	3	18	11	18	106	16	3
78	1	43	24	11	11	74	12	3	5	3	....	2	4	10	47	30	2
79	1	53	45	18	....	90	14	12	5	9	....	2	8	24	57	26	9
80	1	111	59	75	19	113	49	102	20	12	3	10	25	89	68	85	22
81	1	51	46	34	....	101	20	10	10	9	5	7	18	60	24	27	20
82	1	48	41	23	7	64	52	3	4	13	...	11	10	18	75	20	6
83	..	72	39	47	11	69	74	26	3	4	6	11	10	22	113	18	16
84	1	7	16	7	....	27	.....	3	....	2	....	.....	.....	2	25	....	3
85	1	60	54	56	15	101	77	7	7	23	5	22	16	36	106	30	13
86	1	17	14	20	....	28	7	16	2	1	3	1	1	2	32	9	8
87	1	27	28	7	1	52	5	6	2	7	....	3	5	10	36	9	8
88	1	37	36	14	....	24	63	....	3	10	....	3	3	5	67	12	3
89	1	44	46	47	7	49	93	2	3	7	....	12	19	50	70	24	....
90	1	63	45	25	12	72	70	3	5	3	....	10	.....	40	47	46	12
91	..	15	30	18	.. .	29	26	8	2	9	1	3	9	8	36	13	6
92	1	26	39	29	2	75	18	3	6	5	1	9	5	25	16	49	6
93	..	51	23	13	....	85	....	2	1	4	....	.....	3	5	74	7	1
1	60	4,468	3,889	2,810	523	6,619	4,241	830	666	654	237	762	1,003	2,520	5,363	2,853	954
2	66	4,853	3,974	2,856	499	6,635	4,686	861	589	650	165	1,070	893	2,542	5,655	2,969	1,016
3	..	.....	.. ..	.....	24	.....	.....	..	77	4	72	.. ..	110	.	. .	....	.....
4	6	385	85	46	....	16	445	31	....	....	....	308	.....	22	292	116	62
5	65	38	33	24	5	57	36	7	....	...	....	.....	... .	21	46	24	9

XI.—TABLE L.—Protestant Separate Schools.

Statistics.	No. 5 Bromley.	No. 9, Cambridge.	No. 1, Marlboro'.	No. 6, Plantagenet North.	Puslinch.	Rama.	L'Orignal.	Penetanguishene.	Total.
Number of schools	1	1	1	1	1	1	1	1	8
Receipts:	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Balance from 1897	155 69	85	.....	27 19	75 95	78 63	352 08	417 52	1,107 91
Government grants	61 80	3 80	20 00	7 35	12 50	58 00	40 20	138 69	342 34
Municipal grants	.....	.....	.....	.....	.....	.....	629 10	.....	629 10
Trustees' school taxes	200 00	82 80	57 00	310 87	196 84	150 00	.....	2,078 50	3,076 01
Other sources	.....	.....	4 50	4 85	110 00	293 00	.....	.....	412 35
Total	417 49	87 45	81 50	350 26	395 29	579 63	1,021 38	2,634 71	5,567 71
Expenditure:									
Teachers' salaries	200 00	78 00	68 00	250 00	225 00	400 00	575 00	1,364 17	3,160 17
School sites and buildings	122 50	.....	.....	.....	1 08	.....	.....	258 50	382 08
Libraries, maps, etc	13 25	.....	.....	.....	.....	.....	.....	.....	13 25
Other expenses	19 43	6 10	13 50	61 49	124 25	74 29	83 46	957 19	1,339 71
Total	355 18	84 10	81 50	311 49	350 33	474 29	658 46	2,579 86	4,895 21
Balances on hand	62 31	3 35	.....	38 77	44 96	105 34	362 92	54 85	672 50
Teachers:									
Certificate	Female, I.	Female, III.	Female, Temp.	Female, II.	Female, III.	Male, III.	2 Female, 2. III.	1 Male, II.	12 Teachers, 2 Male,
Salary	$200.	$156	$180	$250	$230	$350	$375	3 Female,	10 Female,
							$200	II.	1 I.; 5 II.;
								$275	5 III;
								$250	1 Temp.
								$275	Av. salary:
									Male, $475
									Female, $239
Pupils:									
Total attending	28	14	12	16	26	110	66	233	505
Boys	18	10	6	9	15	59	26	120	263
Girls	10	4	6	7	11	51	40	113	242
Attending less than 20 days	2	4	2	.....	3	13	5	13	42
20 to 50 days	7	2	3	3	3	21	7	22	68
51 to 100 "	9	4	4	4		30	5	55	117

101 to 150 "	2	3	3	5	9	16	19	47	104
151 to 200 "	8	1		4	5	23	30	96	167
201 days to year						7			7
Average attendance	11	6	5	8	11	46	40	139	266
No. in 1st Reader, Part I	6	2	7	1	6	35	18	50	125
" " II	4	3	2	2	4	17	2	35	69
2nd "	6	4	2	1	4	18	9	41	85
3rd "	7	2	1	6	2	20	11	31	80
4th "	4	3		4	8	20	12	57	108
5th "	1			2	2		14	19	38
Writing	28	14	12	16	26	110	66	233	505
Arithmetic	28	14	12	16	26	110	66	233	505
Drawing	28	12	12	16	26	49	66	233	442
Geography	18		5	13	20	41	46	183	326
Music				16	16		66		108
Grammar	12	12	3	16	16	41	48	183	331
History	12	3	1	6	12	39	26	107	206
School houses	F	L	L	F	F	F	B	B	2 B 4 F 2 L
No. of	5	6	1	7	10	14	16	7	66
No. of globes	1				1		1		3

XII.—TABLE M.—Report on Truancy.

Cities.	No. of children otherwise employed during school hours.	No. of cases of truancy reported.	No. of complaints made before Police Magistrates or J. P's.	No. of convictions.	No. of children not attending any school.
Chatham		63	1		
Guelph	5	59	5	2	
Hamilton	16	125	58	12	1,114
Stratford		39	1	1	
St. Catharines		45			
St. Thomas	6	153	3	3	
Toronto		900			
Windsor		86			
Towns.					
Almonte		40			
Aylmer		32			
Barrie		13			
Carleton Place		15			
Collingwood		61			
Cornwall		5			
Dundas		45	5	4	9
Durham			6		
Deseronto	10	75			12
Forest		7			1
Galt		17	4		
Gore Bay		4			
Gravenhurst		13			
Lindsay	2	78	6	5	
Listowel		5	1		
Meaford		2			
Milton		20			
Newmarket		8	2	2	
Niagara Falls	3	72	3	3	72
Niagara		27			
Orillia	3		2	1	
Oshawa		2			17
Oakville		2			
Pembroke		3			
Peterborough		25	3		
Prescott		36			
Parry Sound		1	2	2	1
Petrolea	2	40			
Sault Ste. Marie	5	12	4		6
Sarnia	20				
Simcoe		100			1
Strathroy		1			
St. Mary's		12			

XII.—TABLE M.—Report on Truancy.

Towns.	No. of children otherwise employed during school hours.	No. of cases of truancy reported.	No. of complaints made before Police Magistrates or J. P's.	No. of convictions.	No. of children not attending any school.
Thorold		7			
Tilsonburg			5	5	
Toronto Junction		10	4		
Waterloo		10	2	2	
Walkerton		47	1	1	
Wiarton		8			
Woodstock		3			3
Villages.					
Ailsa Craig	5	15			
Aurora		3			
Burlington		2			
Bayfield		2			
Beaverton			4	1	
Brighton	10				
Bobcaygeon		10			
Bradford	6	27	1		
Bridgeburg		27			2
Burk's Falls		3			3
Chesley		2			
Chesterville		5			5
Colborne	2				
Delhi		17			15
Dundalk		22			
Eganville		1			
Elora		24			24
Exeter	6	10			
Fenelon Falls		18			
Fort Erie		1			
Georgetown		50	1	1	
Glencoe		1			
Grand Valley		2			2
Huntsville		13			
Holland Landing	1				
Little Current		10			
Markdale		1			
Norwich		4			
Point Edward		15			
Port Dover		32	1		
Shelburne		1	2	1	1
Stirling			4		
Streetsville		1			
Thamesville		2			3
Waterford	1	5			2
Total	103	2,654	131	46	1,293

XIII.—TABLE N.—Report on Kindergartens.

Locality.	No. of Kindergartens.	No. of teachers.	No. of pupils attending.	Average attendance.
Belleville	1	1	52	28
Brantford	3	7	309	114
Chatham	1	2	103	40
Guelph	1	1	179	78
Hamilton	13	22	1,318	535
Kingston	4	4	219	133
London	14	28	1,220	413
Ottawa	11	16	961	347
Stratford	3	7	251	91
Toronto	46	125	4,832	1,945
Aylmer	1	1	61	38
Berlin	5	5	250	191
Dundas	1	1	131	56
Galt	1	2	58	51
Ingersoll	1	2	106	45
Leamington	1	1	69	34
Niagara Falls	1	3	127	35
Owen Sound	1	3	132	65
Peterborough	2	4	213	95
Tilsonburg	1	1	90	36
Waterloo	1	1	174	79
Campbellford	1	1	85	27
Hespeler	1	1	81	49
Preston	1	1	62	48
Totals	116	240	11,083	4,573

XIV.—TABLE O.—Report on Night Schools.

Locality.	No. of Night Schools.	Teachers.	Pupils. attending.	Average attendance.
Brantford	2	2	110	6
Hamilton	3	8	200	33
St. Catharines	1	2	60	16
Toronto	10	27	1,004	258
Windsor	1	2	118	47
Zurich	1	1	12	3
Total	18	42	1,504	363

XV.—TABLE P.—General Statistical Abstract.

A General Statistical Abstract, exhibiting the comparative state and progress of Education in Ontario, as connected with Public, Separate and High Schools (including Collegiate Institutes); also Normal College and Normal and Model Schools From the year 1867 to 1898, compiled from Returns in the Education Department.

No.	Subjects compared.	1867.	1872.	1877.	1882.	1887.	1892.	1897.	1898.
1	Population	.....	1,620,851	.....	1,926,922	.....	2,114,321	.....	.....
2	School population between the ages of five and sixteen years, up to 1884 (and five to twenty-one subsequently)	447,726	495,756	494,804	483,817	611,212	595,238	590,055	591,300
3	High Schools (including Collegiate Institutes)	102	104	104	104	112	128	130	130
4	Normal College and Normal and Model Schools	3	3	4	6	6	6	7	7
5	Total Public Schools in operation	4,261	4,490	4,955	5,013	5,277	5,577	5,574	5,587
6	Total Roman Catholic Separate Schools	161	171	185	190	229	312	340	345
7	Grand total of all schools in operation	4,527	4,768	5,248	5,313	5,624	6,023	6,051	6,069
8	Total pupils attending High Schools (including Collegiate Institutes)	5,696	* 7,968	9,229	12,348	17,459	22,837	24,390	23,301
9	Total students and pupils attending Normal College, Normal and Model Schools	800	800	900	1,059	1,204	1,270	1,492	1,492
10	Total pupils attending Public Schools	382,719	433,256	465,908	445,364	462,839	448,204	441,157	436,727
11	Total pupils attending Roman Catholic Separate Schools	18,924	21,406	24,952	26,148	30,373	37,466	41,620	41,667
12	Grand total, students and pupils attending High, Public, Separate, Normal College and Normal and Model Schools	408,139	463,430	500,989	484,919	511,875	509,777	508,659	503,187
13	Total amount paid for the salaries of Public and Separate School Teachers	1,093,516	1,371,594	2,038,099	2,144,448	2,458,540	2,752,628	2,886,061	2,914,830
14	Total amount paid for the erection and repairs of Public and Separate School Houses, and for libraries and apparatus, books, fuel, stationery, etc	379,672	835,770	1,035,390	882,526	1,283,565	1,301,289	1,329,609	1,477,885
15	Grand total paid for Public and Separate School Teachers' salaries, the erection and repairs of school houses, and for libraries, apparatus, etc.	1,473,188	2,207,364	3,073,489	3,026,974	3,742,105	4,053,917	4,215,670	4,392,715
16	Total amount paid for High School (including Collegiate Institutes), Teachers' salaries	94,820	141,812	211,607	253,864	327,452	470,828	532,837	531,887
17	Total amount paid for erection and repair of High School (including Collegiate Institutes) houses, maps, apparatus, prizes, fuel, books, etc	19,190	31,360	51,417	89,857	168,160	215,871	183,139	202,957
18	Amount paid for other educational purposes*	332,825	439,690	250,968	262,307	280,832	353,987	346,820	342,916
19	Grand total paid for educational purposes	1,920,023	2,820,226	3,587,481	3,633,002	4,518,549	5,094,603	5,278,466	5,470,475
20	Total Public and Separate School Teachers	4,890	5,476	6,468	6,857	7,594	8,480	9,128	9,209
21	Total male teachers	2,849	2,626	3,020	3,062	2,718	2,770	2,784	2,743
22	Total female teachers	2,041	2,850	3,448	3,795	4,876	5,710	6,344	6,466

* Colleges and Private Schools are included for 1867 and 1872.

APPENDIX B.—*PROCEEDINGS FOR THE YEAR 1899.*

1. ORDERS-IN-COUNCIL.

1. Payment of gratuity to the family of the late Thomas Kirkland, Principal of the Normal School, Toronto. (Approved 6th April, 1899).

2. Sale of property by Trustees of the Williamstown High School Board. (Approved 13th April, 1899).

3. Payment of balance of gratuity to Miss Mary G. Joyce, Mr. E. B. Cope, Mr. W. G. Workman, and Mr. T. H. McGuirl. (Approved 7th April, 1899).

4. Appointments to the staff of each of the Normal Schools—Mr. F. W. Merchant, M.A., Principal of London Normal School; Mr. John Dearness, Vice-Principal; Mr. W. H. Elliott, B.A., Vice-Principal of Toronto Normal School; and Miss Elizabeth Keyes, teacher of Physical Culture at Ottawa. (Approved 28th July, 1899).

5. Agreement with the W. J. Gage Co., Limited, respecting certain copy books and the Practical Speller, and Geo. N. Morang & Co., Limited, respecting the text-book in Agriculture. (Approved 16th August, 1899).

2. MINUTES OF DEPARTMENT.

1. School day before 24th May to be called Empire Day. (Approved 1st March, 1899).

2. Text-book regulations. (Approved 16th August, 1899).

3. Regulations regarding course of study. (Approved 22nd August, 1899).

4. Regarding specialist standing in English and History. (Approved 24th August, 1899).

5. Amended regulations regarding course of study. (Approved 17th October, 1899).

6. Public School Inspector's Certificate awarded to Mr. S. A. Morgan, B.A., D. Paed. (Approved 17th October, 1899).

3. CIRCULARS FROM THE MINISTER.

DEPARTMENTAL INSTRUCTIONS.

High School Entrance Examination, 1900.

General.

1. The High School Entrance examination for 1900 will begin Wednesday, the 27th of June, at 8.45 a.m., and will be conducted under the provisions of Section 38 of the High Schools Act and Sections 23-27 of the Regulations, subject to the instructions herein contained.

2. Candidates who purpose writing at the examination must notify the Public School Inspector before the 1st of May.

3. No teacher, who has pupils writing at the High School Entrance Examination, shall be eligible as Examiner where such pupils are writing.

4. When the County Council recommends the holding of an examination at any place other than the High School, the presiding examiner shall be paid the sum of $3 per diem, and travelling expenses, for conducting such examination, and the examiners shall be allowed the sum of $1 per candidate for reading the examination papers. It shall be lawful for the County Treasurer to pay all the expenses of such examination on the certificate of the County Inspector.

6. The course of study prescribed is that given in the Revised Regulations of 1896. The paper in Arithmetic will include such questions as will specially test the accuracy of the candidates in the simple rules, as well as their knowledge of the subject; and the paper in Dictation will call for the study of the authorized Spelling Book.

7. The following selections in Literature from the Fourth Book have been prescribed for the examination of 1900:

III. Loss of the Birkenhead; XI, The Evening Cloud; XII. The Truant; XVI. The Humble Bee; XXIV. The Face against the Pane. XXVII. The Battle of Bannockburn; XXXIII. The Skylark; XXXIV. Death of Little Nell; XXXIX. A Psalm of Life; LI. The Heroes of the Long Sault; LVI. The Honest Man; LIX. Yarrow Unvisited; LXIII. The Exile of Erin; LXIV. Ye Mariners of England; LXIX. The Changeling; LXXIX. The Capture of Quebec; LXXXVII. The Song of the Shirt; XCV. A Forced Recruit at Solferino.

The following selections from the Fourth Reader for Memorization:

XIII. The Bells of Shandon; XXXI. To Mary in Heaven; XL. Ring out, Wild Bells; XLII. Lady Clare; XLVI. Lead, Kindly Light; LXVI. Before Sedan; LXXIII. The Three Fishers; CIII. To a Skylark; CV. Elegy written in a Country Churchyard.

8. The following selections from the Fourth Reader of the Canadian Catholic Series may be substituted for the preceding:—

VIII. Hunting the Deer; XVII. My Playmate; XX. The Exile of Erin; XXIII. The Destruction of Sennacherib; XXXI. The Death of Paul Dombey; XXXIII. Dickens in Camp; XXXVI. An April Day; XLI. Yarrow visited; LIX. Ye Mariners of England; LX. Wolfe at Quebec; LXIV. The Water-Fowl; LXV. The Journey to Bethlehem; LXVII. Macarius the Monk; LXXIII. Our New Neighbors; LXXIX. Alec Yeaton's Son; LXXXV. A Psalm of Life; XCI. May-Day; XCVI. The Virgin.

For memorization:—

VI. Lead, Kindly Light; XVIII. About Ben Adhem and the Angel; XXVII. Under the Violets; XLVII. Love of Country; XCIII. God the Comforter; CI. Inscription for a Spring; CX. Our Lady in Italy; CXV. The Bells of Shandon; CXVIII. Elegy written in a Country Churchyard.

Duties of Inspector.

8. The Inspector shall notify the Department not later than the 3rd day of May in each year, of the number of persons desiring to be examined at any High School or other authorized place within his jurisdiction.

9. In any city or town forming a separate inspectoral division, the Inspector or Inspectors of such city or town shall preside at the examinations, and in conjunction with the Board of Examiners for such city or town, shall read the papers and report to the Deparment.

10. In counties in which more High Schools than one are situated, the Inspector for the county shall elect at which High School he will preside, and shall notify the Department of the choice he makes, and in each of the other High Schools the Principal of the High School shall preside.

11. In the case of examinations affiliated with a High School, the Inspector, within whose district such affiliated examinations are held, shall appoint presiding examiners,

who shall be teachers in actual service, notice of which shall be sent to the Education Department; and such Inspector, together with the examiners of the High School with which the examination is affiliated, shall be the Board of Examiners in all such cases.

12. Where, from the number of candidates, or any other cause, additional presiding examiners are required, the Inspector shall make such appointments as are necessary, preference being given to the other members of the Board of Examiners. The Inspector shall not appoint as presiding examiner any teacher who has taken part in the instruction of any of the candidates in the room where he presides, or who is not in actual service.

13. Where more examinations than one are held in an inspectoral division, the papers will be sent by the Education Department to the Inspector, or the presiding examiner, as the case may be.

14. The parcel containing the examination papers shall not be opened till the morning of the examination day, nor shall any envelope containing the papers in any subject be opened until the time appointed in the time-table for the examination in such subject.

Duties of Presiding Examiners.

15. To be in attendance at the place appointed for the examination at least fifteen minutes before the time fixed for the first subject, and to see that the candidates are supplied with the necessary stationery, and seated so far apart as to afford reasonable security against copying.

16. To open the envelope containing the papers in each subject in full view of the candidates, at the time prescribed, and to place one paper on each candidate's desk.

17. To exercise proper vigilance over the candidates to prevent copying and to allow no candidate to communicate with another, nor permit any person except a co-examiner, to enter the room during examination.

18. To see that the candidates promptly cease writing at the proper time, fold and endorse their papers properly, and in every respect comply with the instructions herein contained.

19. To submit the answers of the candidates to the examiners, according to the instructions from the Board.

Duties of Candidates.

20. Every candidate should be in attendance at least fifteen minutes before the time at which the examination is to begin, and shall occupy the seat allotted by the presiding examiner. Any candidate desiring to move from his allotted place or to leave the room shall first obtain permission from the presiding examiner to do so. Any candidate leaving shall not return during the examination of the subject then in hand.

21. Every candidate shall write his answers on one side only of the paper, and shall number each answer. He shall arrange the sheets numerically, according to the questions, and fold them once crosswise, endorsing them with his name, the name of the subject, and the name of the place at which he is examined. No paper shall be returned to a candidate after being placed in the hands of the presiding examiner.

22. Any candidate who is found copying from another or allowing another to copy from him or who brings into the examination room any book, note, or paper having any reference to the subject on which he is writing, shall be required by the presiding examiner to leave the room and his paper and the papers of all the guilty parties shall be cancelled.

Duties of Examiners.

23. The papers of the different candidates shall be so distributed that the same examiner shall read and value the answers in the same subject throughout.

24. Marks are to be deducted for mis-spelt words and for want of neatness as indicated in regulation 25, and on the question papers.

25. Each examiner shall mark distinctly, in the left hand margin, the value assigned by him to each answer or partial answer, shall sum up the total on each page at the foot of the margin, and shall place the general total on the back of the outside sheet, indicating the deductions for mis-spelt words, and the deductions for want of neatness thus, *e. g.*, History, 60—5sp—3n = 52, and initialing each set of papers examined.

26.—(*a*) The reports of the examiners are to be sent (*by mail*) to the Education Department, on or before the 20th day of July, by the Public School Inspector.

(*b*) The bag which contains the question papers is to be returned to the Department (charges prepaid) *at the same time* as the reports are sent.

(*c*) The answer papers of candidates, unless when specially requested, are not to be forwarded to the Department, but are to be retained by the Inspector until October 1st, *after which no case is to be re-considered.*

(*d*) The Inspector shall issue a certificate to each candidate that passes the High School Entrance examination.

(*e*) The names of all candidates admitted by the Board of Examiners may be published immediately after (*but not before*) the reports have been transmitted to the Education Department.

TIME TABLE.

High School Entrance.

First Day.

A. M.	8.45	Reading Regulations.
	9 00—11.00	English Grammar.
	11.10—12 40	Geography.
P. M.	2.00— 4.00	Composition.
	4.10— 4.40	Dictation.

Second Day.

A. M.	9.00—11.00	Arithmetic.
	11.10—12.20	Drawing.
P. M.	1.30— 3.00	History.

Third Day.

A. M.	9.00—11.00	English Literature.
	11.10—11.40	Writing.
P. M.	1.30— 3.00	Physiology and Temperance.

☞Reading may be taken on the above days at such hours as may suit the convenience of the examiners.

MEMORANDA.

The Public School Leaving examination which will correspond hereafter to the examination for Part I. of Junior Leaving Standing, will begin Tuesday, the 3rd day of July, at 8.45 a.m. All candidates for this examination must, as provided by * Regulation 28, make application on forms to be obtained any time in April from the Public School Inspector. The application forms, duly filled up, must be returned to the Inspector not later than the 24th day of May. The answer papers of candidates will be exam-

*A copy of the High and Public School Acts, including the Regulations, was sent in 1896 to each High, Public and Separate School Board; to each Principal of a Collegiate Institute or High School; to each Principal of a County Model School, and to each Public School Inspector. As only a limited supply of the Regulations can be furnished, reference should be made to the copies already sent as above mentioned.

ined as provided by Regulations 82 and 83. Candidates who fail at this examination may, under the provisions of Regulation 29, be awarded High School Entrance certificates. The following are the amended Regulations regarding this examination :—

Public School Leaving Examination.

The Public School Leaving Examination will hereafter be identical with the examination prescribed for Part I. of Junior Leaving Standing. Public School Leaving certificates will be issued by the Public School Inspector to all pupils of Public Schools in his inspectorate who pass the examination of Part I. of Junior Leaving Standing. The present holders of Public School Leaving certificates will be entitled to certificates of having passed the examination of Part I. Junior Leaving Standing by passing the examinations in Arithmetic and Mensuration, Grammar and History, the prescribed percentage on the total of these subjects being also exacted.

Part I., Junior Leaving Standing.

The subjects prescribed for Part I. of Junior Leaving Standing are the following : Reading, Drawing, Geography, Botany (or Agriculture), Writing with Book-keeping and Commercial Transactions, English Grammar, English Literature, Arithmetic and Mensuration, English Composition and History. The course in Agriculture will include what is taken up in the authorized text book as far as page 73. The course in the other subjects will be based as heretofore upon the work prescribed in the Regulations for Forms I. and II, subject to requirements for examinations hereinafter mentioned. For 1900 no examination will be held in Reading, English Literature, Drawing Book-keeping, Botany, or Agriculture, but no name of a student who has not given due attention to these subjects is to be included in the confidential report of the Principal.

No grant to a High School or to a Continuation Class will be paid until the Principal and Chairman of the School Board report that each obligatory subject of the course, whether prescribed for examination or not, has, in their judgment, received due attention on the part of the pupils while attending the school.

It is expected that throughout the course, until pupils have completed what is required for Part I. of Junior Leaving Standing, at least two half-hour periods per week shall be given regularly to Reading, and an equal time to English Literature. Regarding Drawing, Book keeping, Botany or Agriculture, at least two half-hour periods per week for each of these subjects are to be given regularly to pupils enrolled in Form I. of the High School or Form V. of the Public School ; that is practically during the first year of the course in preparation for Part I. of Junior Leaving Standing.

Examination Requirements.

(Part I. Junior Leaving Standing.)

Geography.

The building up of the earth ; its land surface ; the ocean ; comparison of continents as to physical features, natural products and inhabitants ; relation of physical conditions to animal and vegetable products, and of natural products and geographical condition to the occupations of the people and national progress. Form, size and motions of the earth; lines drawn on the map, with reasons for their position ; relation of the positions of the earth with respect to the sun, to light and temperature ; the air ; its movements ; causes affecting climate. Natural and manufactured products of the countries of the world, with their exports and imports ; transcontinental commercial highways and their relation to centres of population ; internal commercial highways of Canada and the chief internal commercial highways of the United States ; commercial relations of Great Britain and her colonies. Forms of governments in the countries of the world and their relation to civilization. One examination paper.

Arithmetic and Mensuration.

Proofs of elementary rules in Arithmetic ; fractions (theory and proofs); commercial Arithmetic ; mental Arithmetic ; Mensuration of rectilinear figures One examination paper. (The questions will call for accuracy and will have special reference to the requirements of ordinary life.)

English Grammar.

Etymology and Syntax, including the inflection, classification, and elementary analysis of words and the logical structure of the sentence and paragraph ; exercises chiefly on passages from authors not prescribed. One examination paper. (The questions will call for such an elementary knowledge of the subject as will be of special value in the ordinary use of the language.)

English Composition.

For examination purposes an essay of about two pages of foolscap on one of the themes prescribed by the examiners will be required. The penmanship, spelling, punctuation, construction of sentences, the logical arrangement of the thought, the literary accuracy and aptness of the language and the general plan or scope of the whole essay will be specially considered by the examiners, One examination paper

History of Great Britain and Canada.

Great Britain and Canada from 1763 to 1885, with the outlines of the preceding periods of British History.

The Geography relating to the History prescribed. One examination paper.

The following modifications are also made in the Revised Regulations which came into force in October, 1896 :—

* Public School Course of Study.

The Public School course of study is amended so as to include Agriculture among the obligatory subjects in all rural schools for Forms IV. and V.; for the latter Form the text-books are to be used by the pupils, but for the former the instruction is to be by conversation only. Agriculture will remain optional for all Public Schools in urban municipalities. Needlework, Domestic Economy, and Manual Training may be taken up in urban schools with the approval of the trustees. In Poetical Literature, the course for Form V. will embrace such selections from the High School Reader as are recommended by the teacher. No special selections are prescribed by the Department. Where the trustees have provided books for Supplementary Reading, such works as are recommended by the teacher, under the direction of the Inspector, may also be read.

Continuation Classes.

Under the provisions of the Amendment of 1899 to the Public Schools Act, the course of study (Regulation 20) for Continuation Classes is extended to include the subjects prescribed for Form II. of the High School course. More advanced work of the High School may be taken up if requested by the Trustees and approved by the Public School Inspector. In Class (*a*) the Principal must give regular instruction only to pupils of Form V. or to those doing higher work. In the other classes, the teachers must have such qualifications as are approved by the Public School Inspector.

Hereafter (Regulation 21) there will be four grades of Continuation Classes, viz :— (*a*) Schools in which the Principal holds a First Class Certificate (unless occupying the position since April, 1899), and gives regular instruction only to pupils of Form V., or to

* See Schedule A.—Public School Course of Study of the Revised Regulations of 1896. It should be remembered that Algebra and Geometry are obligatory subjects of Form V. The time to be devoted to these subjects, as well as to Geography, Arithmetic and Mensuration, English Grammar, English Composition, History of Great Britain and Canada, is left to the direction of the teacher, who should be guided by the Inspector (Regulation 17). Regarding Reading, English Literature, Drawing, Bookkeeping, Botany or Agriculture, the minimum amount of time, as specified herein for Part I. Junior Leaving Standing, must be given.

those doing higher work. (*b*) Schools in which there are at least two teachers, and a class in regular attendance of at least ten pupils who have passed the High School Entrance examination. (*c*) Schools where there are at least five; and (*d*) in which there are at least three, who have passed the High School Entrance examination, and are in regular attendance.

No grant will be paid for Continuation Classes unless the Inspector (who shall examine the statements signed, as above mentioned by the Principals and Chairmen of the Boards) reports that the obligatory subjects, whether prescribed for examination purposes, or not, have received proper attention. The grant will be paid according to the nature and extent of the work done, and not on the results of examinations.* In order that a school may obtain the grant, it will be necessary that the minimum number of pupils be enrolled during each month of the full academic year ending in June.

TORONTO, March, 1899.

HIGH SCHOOL AND UNIVERSITY MATRICULATION EXAMINATIONS.

INSTRUCTIONS TO PRESIDING EXAMINERS, 1899.

The Presiding Examiners are *requested to peruse carefully* the following instructions and see that they are fully carried out:

(1) Each Inspector, or such other person as may be appointed by the Minister, shall himself, in person, receive from the Department or the Inspector, the examination papers, and shall thereupon be responsible for the safe keeping of the parcel containing the same, unopened, until the morning of the first day of the examination.

(2) On the receipt of the bag containing the question papers the Presiding Examiner will see that *the seal is intact.* The bag can be opened by breaking the wire close to the seal.

(3) The Presiding Examiner will satisfy himself that all necessary arrangements are made by the School Board in due time for the examination. If the trustees have not placed a clock in each room used for examination purposes the Presiding Examiner shall have power to hire the use of one for each room during the time required for the examination, and charge the same as part of the expenses of the examination.

(4) The Presiding Examiner shall, if there is sufficient accommodation and if a sufficient number of papers have been received, admit candidates that through some oversight did not send their applications to the Inspector. The names of such candidates are to be entered in the report-blank specially provided, with such information as is required of the other candidates. This report-blank and the required part of the fee with one dollar additional as provided, should be sent by the Presiding Examiner, to the Education Department. The balance of the fee should be sent to the Board that bears the expense of the examination.

(5) The Presiding Examiner shall exercise necessary vigilance at all times while the candidates are engaged, and he *shall not give his attention to any work other* than that

*It should be understood that no pupil, unless he intends to become a teacher, is required to write at the examination for Part I Junor Leaving Standing (Public School Leaving). No grant will hereafter be paid to a school on account of the sucess of pupils at the Public School Leaving examination, and a school entitled to rank in one of the grades for Continuation Classes, will receive its share of the appropriation for such classes, even if no pupils from the school should become candidates at any examination. Forms of reports for Continuation Classes may be obtained from the Inspector in April. These should be duly filled up and returned to the Inspector the 1st of July. The Legislative Grant for a Continuation Class will depend upon the number of the different grades in the Province, and cannot be determined until the County Inspectors make their reports for Continuation Classes to the Education Department. The report of the Inspector will be due at the Department July the 10th, and if promptness is observed by teachers in making the necessary returns to the Inspector, the grants for Continuation Classes may be paid in August. It should be recollected that the success of pupils at the High School Entrance examination in June will in no way affect the question of whether or not a school is entitled to be placed in any of the grades for the academic year ending the same month.

which pertains to his duties as Presiding Examiner. He shall take all necessary care to render it impossible for the instructions to candidates to be violated without his knowledge. This instruction (5) is to be observed however small may be the number of candidates.

(6) It is imperative that the regulations be enforced by the Presiding Examiner and strictly observed by the candidates. In particular, the examination papers shall be distributed, and the answer papers collected *punctually* at the time indicated in the time-table. The Presiding Examiner has no authority to deviate from the official time-table.

(7) In the examination room, candidates, whether writing on the same subject or on different subjects, shall be seated at least five feet apart. All diagrams or maps having reference to the subject of examination shall be removed from the room, and books, papers, etc., removed from the desks; all arrangements shall be completed, and the necessary stationery distributed at least *fifteen minutes* before the time appointed for the commencement of the first subject of the examination, and at least *five minutes* before each other subject is begun.

(8) No person except the Examiners and any necessary attendants shall be present with the candidates in any room at the examination; and at least one Examiner shall be present during the whole time of the examination in each room occupied by the candidates.

(9) The Presiding Examiner shall, as indicated on the time table, read to the candidates their duties, shall draw attention to any feature of them that may require special care during the examination, and shall be explicit in giving instructions to the candidates as to the manner in which the slips are to be attached to the envelopes. Great care should be taken in distributing the proper number of envelopes and in accounting for such envelopes as have been distributed. The instructions (5), (6) and (7) for candidates are also instructions to Presiding Examiners.

(10) *Punctually* at the time appointed for the commencement of each examination, the Presiding Examiner shall, in the examination room and in the presence of the candidates and other Examiners (if any), break the seal of the envelopes containing the examination papers, and give them to the other Examiners and the candidates. The papers of only the subject or subjects required shall be opened at one time. Until the examination in the subject is over no examination papers, other than those which the candidates receive, shall be taken out of the room.

(11) *Punctually* at the expiration of the time allowed, the Examiner shall direct the candidates to stop writing, and cause them to hand in their answer papers *immediately*, duly fastened to the envelopes.

(12) The Examiner shall keep upon his desk the tally list (check-list of candidates and subjects) and as each paper in any subject is handed in, (and the Examiner should carefully note the superscription of the envelope—the subject and the candidate's name), he shall check the same by entering the figure "1" opposite the name of the candidate. After the papers are handed in the Examiner shall not allow the envelopes to be opened, and he shall be responsible for their safe keeping until transmitted to the Education Department, or placed in the hands of the Presiding Examiner.

(13) For special instructions *re* the examinations in Reading, Book-keeping, Botany, Drawing, Stenography, Chemistry, Biology, etc., see Confidential Circulars of Forms I., II., III., IV., which are forwarded to each Presiding Examiner prior to the examinations.

Reports, etc.

(14) The Presiding Examiner shall report to the Education Department at the close of the examination in the "Remarks" column of the Diagram Blank, any particulars in which the Instructions, etc., were not observed and he shall mention any facts regarding the examination that he deems expedient to have brought before the Board of Examiners. The Presiding Examiner and his assistants shall sign a declaration that in all other respects the Instructions and Regulations were fully complied with.

(15) The presiding Examiner as part of his report to the Department shall send a diagram of each room on the forms provided, showing the position occupied by each candidate and Presiding Examiner during the examination of each Form.

(16) The Presiding Examiner shall not arrange the answer papers according to subjects, but shall arrange them so that the answers of each candidate of each Form shall be sent together and *in the order that their names appear* on the list of candidates for the examination. To facilitate this, elastic bands have been supplied, one for each candidate's set of answers.

(17) The prompt return to the Education Department of the answers at the close of the respective examinations is essential, and may be greatly facilitated if the answers are sorted at the close of each day's examination. All diagrams and reports (*except the tally-lists*) should be forwarded to the Department *by post* on the respective days that the answers are forwarded. The tally-list of each Form should be returned in its respective bag with the candidates' answer-envelopes.

(18)—(*a*) The answers of the candidates taking the Form I. examination, together with the Form I. tally-list, shall be returned at the close of that examination in the bag marked with *blue*.

(*b*) The answers of the candidates taking the Form II. examination, together with the Form II. tally-list, shall be returned at the close of that examination in the bag marked with *red*, those for the Commercial Diploma being placed in a *separate parcel*.

(*c*) The answers of the candidates for Form III. and IV. examinations, together with the Form III. and Form IV. tally-lists, shall be returned at the close of those examinations in the bag marked with *green*.

(*d*) The answers of scholarship candidates, in the various Form examinations, shall be enclosed in the envelopes specially provided, shall be made up in *separate parcels* and shall be returned to the Department in the bags of their respective Forms..

(*e*) Each bag shall be so folded and tied that the words "The property of the Education Department" will be outwards. The shipping tag should be securely attached to the strap on each bag.

(*f*) All express charges must be prepaid, and no commercial value should be placed upon the bags and contents.

(*g*) All surplus examination papers may be given at the close of the examination to the Principal of the school.

Expenses of the Examination.

The Treasurer of the High School Board or of the Public School Board of the school where the examination is held shall pay on the certificate of the Public School Inspector, all the expenses of the examination which shall include the following:—

(1) For preparing the lists of candidates, the Inspector shall be entitled to the remuneration of $2.00, provided that the number of candidates writing does not exceed twenty. For each additional twenty candidates or fraction of that number, the Inspector shall be entitled to an additional dollar. It is to be understood that the number of applications received, and not the Forms for which candidates write, will determine the amount to be paid for this service.

(2) For conducting the examination the Presiding Examiner shall be entitled to $4.00 a day and actual travelling expenses, which shall include railway fare or the ordinary cost of their conveyance.

(3) For meeting incidental expenses of the examination, the cost of stationery, etc., and the payment of any additional services required during the examination.

Instructions to Candidates.

(1) Each candidate shall satisfy the Presiding Examiner as to his personal identity before the commencement of the second day's examination, and any person detected in attempting to personate a candidate shall be reported to the Department.

(2) Candidates shall be in their allotted places before the hour appointed for the commencement of the examination. If a candidate be not present till after the appointed time, he shall not be allowed any additional time. No candidate shall be permitted, on any pretence whatever, to enter the room after the expiration of an hour from the commencement of the examination.

(3) No candidate shall leave the room within *one hour* after the distribution of the examination papers in any subject; and if he then leave he shall not be permitted to return during the examination on such subject.

(4) Every candidate shall conduct himself in strict accordance with the regulations. Should he give or receive any aid or extraneous assistance of any kind, in answering the examination questions, or should he leave his answer exposed so that any candidate may copy from him he will forfeit any certificate he may have obtained. He shall also be debarred for two years from writing at any examination conducted by the Education Department.

(5) Candidates are reminded that should any candidate be detected in talking or whispering, or making signs to another candidate, or in copying from another, or allowing another to copy from him, or in having in his possession, when in the room, any book, notes, or anything from which he might derive assistance in the examination, it shall be the duty of the Examiner, if he obtain clear evidence of the fact at the time of the occurrence, to cause such candidate at once to leave the room; and such candidate shall not be permitted to enter during the remaining part of the examination, and his name shall be struck off the list. If, however, the evidence be not clear at the time, or be obtained after the close of the examination, the Examiner shall report the case to the Department.

(6) Candidates are also reminded that the Presiding Examiner is not allowed to make *any explanation* or other statement regarding the probable meaning of any question or to *give any advice* as to what questions should be undertaken by the candidates or how any question should be answered.

(7) Should any error appear to have been made in any question paper *no attention* should be drawn to it during the time of the examination by either the Presiding Examiner or any of the candidates. Candidates may, however, at the end of the examination period submit the matter to the Presiding Examiner who, if he considers it necessary, will report on the matter to the Department at the close of the examination.

(8) Every candidate shall write the subject of examination very distinctly at the top of each page of his answer paper, in the middle. If a candidate write his name or initials, or any distinguished sign or mark on his answer papers, or use any other paper or ink than that provided by which his identity might be disclosed, or insert in the envelope any matter not pertinent to the examination, his examination will be cancelled.

(9) Each candidate, in preparing his answers, shall write on one side only of each sheet, shall page the sheets in each subject, shall write distinctly, on the last sheet, the total number of sheets enclosed in the envelope, shall fold them once across, place them in the envelope provided by the Department, seal the envelope, write on the outside of the envelope the subject of examination only, and on the slip provided, his name in full (surname preceding), and then securely fasten the slip to the envelope, as instructed by the Presiding Examiner.

EXTRACTS FROM INSTRUCTIONS TO APPLICANTS AND INSPECTORS.

Fees.

First Form examination, $2. Second Form examination, Part I, $2. Third Form examination, $5. Fourth Form examination, Parts I and II, each $3; taken together, $5. Commercial Diploma examination, $4, (part $2). For candidates for examination in the additional subjects (not to exceed three) for pass Matriculation into any University or Learned Profession, the fee shall be $2. If the fees for a candidate amount to more than $5, only $5 will be required.

Attention is directed to the scale of fees to be paid by candidates. When the fee is $5, $4, $3, or $2, the amount to be sent to the Department is $3, $2, $2, or $1, respectively. The balance of fees received is to be forwarded to the High School Board or other body that bears the expenses of the examination.

Applications will not be received by the Inspector after the date mentioned, and candidates are reminded that they should in no case forward their applications to the Education Department. If the candidate should, through an oversight, neglect to have his application duly sent to the Inspector, he may present himself at the examination, when the Presiding Examiner is at liberty to admit him, provided there is the necessary accommodation, and that a sufficient number of examination papers has been forwarded. An additional fee of $1 will be exacted by the Presiding Examiner from a candidate who presents himself in this way.

Toronto, March, 1899.

CIRCULAR TO INSPECTORS.

Empire Day.

At a meeting of the Dominion Education Association, held at Halifax, Nova Scotia, in August, 1898, the following resolution was unanimously adopted :—

" Resolved that the Association recommends that the School Day immediately preceding the 24th of May be set apart as ' Empire Day,' and that the Education Departments in the Provinces and Territories be respectfully requested to arrange for such exercises in their respective schools as will tend to the increase of a sound patriotic feeling."

The Council of Public Instruction for the Province of Nova Scotia and the Protestant Section of the Council of Public Instruction for Quebec, have already acted on the recommendation above stated, and the Education Department of Ontario, on the 1st day of March, 1899, adopted the following Minute :—

" The School Day immediately preceding the 24th of May shall be devoted specially to the study of the history of Canada in its relation to the British Empire and to such other exercises as might tend to increase the interest of the pupils in the history of their own country and strengthen their attachment to the Empire to which they belong—such day to be known as ' Empire Day.' "

According to the Minute quoted above, "' Empire Day " this year falls on Tuesday, the 23rd of May. It is not necessary that I should specify in detail how the day should be observed. The outline given below might be taken generally as a guide to teachers and trustees :—

The Forenoon.

Part of the forenoon might be occupied with a familiar talk by the teacher on the British Empire, its extent and resources ; the relation of Canada to the Empire ; the unity of the Empire and its advantages ; the privileges which, as British subjects, we enjoy ; the extent of Canada and its resources ; readings from Canadian and British authors by the teacher ; interesting historical incidents in connection with our own country. The aim of the teacher in all his references to Canada and the Empire should be, to make Canadian patriotism intelligent, comprehensive and strong.

The Afternoon.

The afternoon, commencing at 2.30 P.M., might be occupied with patriotic recitations, songs, readings by the pupils and speeches by trustees, clergymen and such other persons as may be available.

The trustees and public generally should be invited to be present at these exercises.

During the day the British Flag or Canadian Ensign should be hoisted over the school building.

Will you kindly inform the teachers of your Inspectoral District of the action of the Department and of the purposes of "Empire Day" as herein set forth.

Toronto, March, 1899.

INDUSTRIAL ART EDUCATION.

Medals and Certificates.

The Annual Provincial Examinations in Drawing will be held on the 27th, 28th and 29th of April, 1900. I enclose Time Table.

Under the Departmental regulations for promoting Industrial Art Education in this Province, the pupils of Art Schools, Ladies' Colleges, Public Libraries, and Public and High Schools have the privilege of competing at these examinations for the following Provincial Medals and Certificates:

Medals and Special Certificates.

*Gold Medal and Certificate for Advanced Course.

Silver Medal and Certificate for the highest number of marks in the Mechanical Course.

Silver Medal and Certificate for the best original design suitable for industrial purposes, subject optional.

Silver Medal and Certificate for the best original design suitable for industrial purposes, subject optional (for Public Libraries only).

Silver Medal and Certificates for the best specimen of Machine Drawing from models.

Silver Medal and Certificate for the best original drawing in Building Construction or Architecture.

Four Bronze Medals and Certificates for the highest number of marks in the Primary Drawing Course, one each for Art Schools or Ladies' Colleges; Public Libraries; High Schools; Public Schools.

Bronze Medal and Certificate for the best oil or water color painting.

Bronze Medal and Certificate for the best specimen of china painting.

Bronze Medal and Certificate for the best drawing from life.

Bronze Medal and Certificate for the best specimen of wood carving.

Bronze Medal and Certificate for the best specimen of either of the following, namely, wood engraving, photogravure, etching on copper, or drawing for lithography.

*The competition for Gold Medal includes the following subjects:—

(*a*) *Drawing from the Antique, full size.* The drawing shall not be less than two feet in height, on white paper, in crayon, either with or without the aid of stump, background shaded or plain, work to be finished in 36 hours, regular school time, without assistance, and certified by the teacher. (*b*) *Original Design.* This is to be executed on paper supplied by the Department; size of drawing not less than six inches by four inches, time four hours. The designs recommended are those suitable for wall paper, carpets, oil cloths, etc. Samples of work done during the session must be sent to the Department for examination in (*c*) *Shading from the Antique,* (*d*) *Outline from the Antique* and (*e*) *Industrial Design.* There is no restriction as to the manner of execution, nor the time occupied in the sessional work, but every drawing must be certified by the teacher as the work of the pupil.

Bronze Medal and Certificate for the best specimen of modelling in clay.

Teachers must certify that the work, except time studies sent in for examination, was done by the pupils without assistance.

Special Certificates.

Special Certificates will be awarded for Industrial Design, Wood Carving, Engraving on Wood and Copper, Photogravure, Lithography, Modelling in Clay, Drawing from the Antique, Oil Color Painting, Water Color Painting, Monochrome Painting, and Sepia Drawing.

The holders of Full Certificates are legally qualified to teach Drawing in the Public, High and Art Schools, Public Libraries; and the Education Department requires candidates for Commercial Specialists Certificates to hold in addition to other qualifications, Art School Certificates in Primary and Advanced Geometry and Perspective, also in Model Drawing and Memory or Blackboard Drawing.

As the examination papers are now being prepared for the printer you will oblige by informing me, without delay, how many pupils in your School will take the departmental examinations in the Primary and Advanced Courses.

On receipt of your reply, blank forms of application will be sent you which must be filled in and sent to this Department not later than the 4th of April. The examination papers are sent from the Education Department free, and the only expense to a school holding examinations is the payment of a presiding examiner appointed by the Minister.

Toronto, March, 1899.

SPECIALISTS' CERTIFICATES.

INFORMATION FOR CANDIDATES.

Non-Professional Qualifications.

The regulation dealing with the requirements is No. 51 of the Revised Regulations which were adopted in 1896. That Regulation reads as follows:

Any person who obtains an Honor Degree in the department of English and History, Moderns and History, Classics, Mathematics, or Science as specified in the calendars of any University of Ontario, and accepted by the Education Department, shall be entitled to the non professional qualification of a specialist in such department. A graduate who has not taken an Honor Degree in one of the above courses shall be entitled to the non-professional standing of a specialist on submitting to the Department of Education a certificate from the Registrar of the University that he has passed, subsequent to graduation, the examinations prescribed for each year of the Honor course of the department for which he seeks to be recognized as a specialist, and which he has not already passed in his undergraduate course; or any examination which is recommended by the University as equivalent thereto and accepted as such by the Education Department.*

*The following recommendation of the Minister has been approved August 24, 1899, by a minute of the Education Department:—

The undersigned has the honor to report that the course for specialists in English and History, as accepted by the Education Department, under the provisions of Regulation 51, appears first in the calendar of the University of Toronto in 1895-6, and that this course for specialists includes Honors in English, History, Latin and Greek throughout the four years of the course; that students who were undergraduates of the University prior to 1896 had not the opportunity of taking the regular Honor Course in said department in pursuing the course in English and History, and should they take the course now, as provided in said Regulation of the Education Department, they would take—what is now required in connection with the other courses for specialists—four years' Honors in extra subjects, namely, Latin and Greek, as well as four years' Honors in English and History.

In view of these circumstances, the undersigned recommends that any candidate for a certificate as a specialist in English and History, who was an undergraduate of Toronto University prior to 1896 (and of such other Universities as have entered into agreement with the Education Department in this regard), be exempted from the Latin and Greek Honor examinations required for the English and History course by the terms of said Regulation of the Education Department.

Hereafter all candidates for the non-professional standing of specialists must submit to the Educational Department a certificate from the Registrar of the University showing that they have complied with the requirements agreed to by the Education Department and the University concerned. All enquiries regarding the courses accepted should be addressed to the University.

Professional Qualifications.

Every candidate for the professional examinations must hold the necessary non-professional standing before writing at the examinations at the Normal College for a specialist's certificate. The holder of an Assistant High School Teacher's Certificate who has the necessary non-professional standing is not required to attend the Normal College, but may write at the examination for specialist on the paper in "Methods" only. This paper may be taken at Hamilton or at any other place in the Province if the candidate makes arrangements with the Public School Inspector to preside. The department must be informed of such arrangements at least one month before the examination.

Public School Inspector's Certificates.

Regulation 89. Any person with five years successful experience as a teacher, of which at least three years shall have been in a Public School; who holds either specialists non-professional standing obtained on a University examination, or a Degree in Arts from any University in Ontario with first class graduation honors in one or more of the other recognized departments in such University; and who has passed the examinations of the Ontario Normal College for a specialist's certificate, shall be entitled to a certificate as an inspector of Public Schools.

Commercial Specialists.

Regulation 52. Any person who passes an examination in the subjects set forth in Schedule C—course for Commercial Specialists (each subject to be valued at 100), and who is the holder of a High School Assistants' Certificate obtained either before or after passing such examination, shall be entitled to a Commercial Specialist's Certificate.

SCHEDULE C.

Bookkeeping.—Single and double entry bookkeeping; wholesale and retail merchandising, commission business, manufacturing; warehousing, steamboating, exchange, joint stock companies, municipalities, societies and public institutions. statements and balance scheets, partnership adjustments, liquidation and administration of estates, auditing, filing papers, and the use of special columns and the various other expedients in bookkeeping to save time and labor and secure accuracy of work.

Penmanship.—Theory and practice of penmanship, Spencerian and vertical; ledger headings; marking and engrossing.

Commercial Arithmetic.—Interest, discount, annuities certain, sinking funds, formation of interest and annuity tables, application of logarithms, stock and investments, partnership settlements, partial payments, equation of payments and exchange.

Banking.—Money and its substitutes; exchange; incorporation and organization of banks; business of banks, their relation to each other and to the business community; the clearing house system; legal requirements as to capital, shares, reserves, dividends, note issue: insolvency and consequent liability.

Business Forms.—Invoices, accounts, statements, due bills, orders, receipts, ware house receipts, deposit receipts, deposit slips, bank pass books, promissory notes, bills of exchange, bank drafts, cheques, bonds, debentures, coupons, instalment scrips, stock certificates, stock transfers, proxies, letters of credit, affidavits, balance sheets, pay sheets, time sheets and special forms of general bookkeeping, books to suit special cases.

Law of Business.—Contracts, statute of limitations; negotiable paper and endorsements; sales of personal property; accounts, invoices, statements, etc.; chattel mortgages; real estate and mortgages; interest; agency; partnership; corporations; guarantee and suretyship; receipts and releases; insurances; master and servant; landlord and tenant; bailment; shipping and transportation; host and guest; telegraphs; auctions; patents; copyrights; trade marks and industrial designs; affidavits and declarations; subjects and aliens; wills, and joint stock companies.

Stenography—The principles of Stenography; writing from dictation at a speed of sixty words per minute, and accurate transcription into longhand at a speed of twelve words per minute; the dictated matter to comprise business correspondence or legal documents.

Drawing.—Object and Model Drawing; Prospective and Geometrical Drawing.

The examination in Drawing will be on the papers used at the Art School examinations in Primary and advanced Geometry and Perspective and in Model, Memory and Blackboard Drawing.

For the rest of the course the examinations will be held in July, and application with the fee of $5 should be sent to the Public School Inspector not later than the 24th of May.*

Toronto, April, 1899.

EXAMINATIONS FOR TEACHERS OF FRENCH-ENGLISH SCHOOLS.

Unless otherwise legally qualified for Ontario, all teachers in French-English Schools, Public or Separate, in Nipissing District, will be required to pass an examination as herein detailed. The certificates granted to successful candidates will be valid for one, two or three years, depending upon the standing obtained, and will be accepted only in schools where French is required to be taught in addition to English. Teachers of such schools who may fail to present themselves at this examination will not be given permission to teach after July, 1899.

Limits of Examination.

Text-Books

Reading.—Oral reading. — High School Reader.

English Grammar and Rhetoric—Etymology and Syntax, including the inflection, classification, and elementary analysis of words and the logical structure of the sentence; rhetorical structure of the sentence and paragraph; exercises chiefly on passages from authors not prescribed. — Public School Grammar.

English Composition.—Essays on familiar subjects; familiar letters.

English Poetical Literature—Intelligent and appreciative comprehension of the prescribed texts; memorization of the finest passages; supplementary reading from authors prescribed by the teacher; oral reading of the texts. The examination in literature will consist of "sight work" as well as on questions on the prescribed texts. — High School Reader.

History.—The History of Canada; British History. — Public School History.

*Books of reference recommended by the examiners:—

The Canadian Accountant. By Beatty and Johnson.
Expert Bookkeeping. By C. A. Fleming, Owen Sonnd.
The Theory of Finance. By Geo. King. C. & E. Layton, Farringdon St., London, E.C.
Money and the Mechanism of Exchange. By W. S. Jevons. The Humboldt Publishing Co., New York.
Banking Act of 1890. The Carswell Co, Adelaide St., Toronto, Ont.
The Laws of Business. By C. A. Fleming.
Expert Bookkeeping. By C. A. Fleming.
Complete Phonographic Instructor. By Sir I. Pitman.

Geography.—The building up of the earth ; its land surface ; the ocean ; comparison of continents as to physical features, natural products and inhabitants ; relations of physical conditions to animal and vegetable products, and of natural products and geographical condition to the occupations of the people and national progress. Form, size and motions of the earth ; lines drawn on the map, with reasons for their position ; relations of the positions of the earth with respect to the sun, to light and temperature ; the air ; its movements ; causes affecting climate. Natural and manufactured products of the countries of the world, with their exports and imports ; transcontinental commercial highways and their relation to centres of population ; internal commercial highways of Canada and the chief internal commercial highways of the United States ; commercial relations of Great Britain and her colonies. Forms of governments in the countries of the world and their relation to civilization. Public School Geography. Text Books.

Arithmetic and Mensuration.—Proofs of elementary rules in arithmetic ; fractions (theory and proofs) ; commercial arithmetic ; mensuration of rectilinear figures. Public School Arithmetic.

Drawing.—Object and model drawing ; High School Drawing Course, Books Nos. 1 and 2. High School Drawing Course.

Bookkeeping.—Bookkeeping by single and double entry ; commercial forms, such as drafts, notes and cheques ; general business transactions. The bookkeeping shall be specially suitable for farmers and artisans or for retail merchants and general traders. High School Bookkeeping.

French Grammar. Robert.

French Composition.

English Literature Selections.

1899.—V. To Daffodils ; XVIII. Rule, Britannia ; XX. The Bard ; XXXI. To a Highland Girl ; XXXV. The Isles of Greece ; XLIX. Indian Summer ; LII. The Raven ; LIV. My Kate ; LXII The Cane-Bottomed Chair ; LXVII. The Hanging of the Crane ; LXIX. As Ships Becalmed at Eve ; CV. The Return of the Swallows.

1900.—V. To Daffodils ; XX. The Bard ; XXXI. To a Highland Girl ; XXXIV. The Well of St. Keyne ; XXXVI. Go where Glory Waits Thee ; XXXVII. Dear Harp of My Country ; XLI. The Cloud ; XLVI. The Bridge of Sighs ; LI. Horatius ; LXVII. The Hanging of the Crane ; LXXIX. The Lord of Burleigh ; LXXXI. The " Revenge."

In French Grammar and Composition the papers will be those prepared for the French Model Schools in Ottawa and Plantagenet. In all other subjects the papers will be those set for the Public School Leaving Examination.

Candidates who are not familiar with the scope and nature of the Examination may derive some help from a study of the Public School Leaving papers of former years, which may be obtained at twenty-five cents (25c.) a set from Messrs. Rowsell & Hutchinson, No. 76 King St. East, Toronto.

This examination will be held at Mattawa, North Bay, and Sudbury, beginning on June 28th, at 8.45 a. m.

Applications should be made not latter than May 24th, to the Rev. George Grant, B. A., Inspector of Public Schools, Orillia. The fee of $1 must accompany each application.

Toronto, April, 1899.

DEPARTMENTAL REGULATIONS.

Approved, August, 1899.

TEXT-BOOKS AUTHORIZED FOR USE IN PUBLIC SCHOOLS, HIGH SCHOOLS AND TRAINING SCHOOLS.

1. The text books named in Schedule "A" shall be the authorized text-books for Public Schools. Pupils taking any optional subject in the Public School course may use the text-book authorized in such optional subject. The text-books in French and German are authorized only for schools where the French or German language prevails, and where the Trustees, with the approval of the Inspector, require French or German to be taught in addition to English. Text-books marked "optional" shall be introduced into the Public Schools only by resolution of the Board of Trustees. Books authorized in Forms I. and II. of the High School course may be used by pupils taking the corresponding subjects of Continuation classes.

2. The text books named in Schedule "B" shall be the only authorized text-books in High Schools and Collegiate Institutes for the course of study prescribed in Forms I., II, and III. Books authorized for use in the Public Schools may be used in Forms I. and II.

3. The text-books named in Schedule "C" shall be the authorized text-books for Model Schools, Normal Schools and the Ontario Normal College. Only such books shall be used by the teachers-in-training as may be ordered by the Principal.

4. Any text-books used in any school on the 1st of July, 1899, and recommended by resolution of the Trustees to be continued in use, shall be deemed as authorized in such school until further notice. The vertical or slanting copy books heretofore authorized, and published by the Rose Publishing Company, may be used in any Public School.

5. For religious instruction, either the Sacred Scriptures or the Scripture Readings adopted by the Education Department, shall be used as prescribed by the Regulations of the Education Department.

Public Schools. (Schedule A.)

First Reader, Part I.	$0 10
First Reader, Part II.	0 15
Second Reader	0 20
Third Reader	0 30
Fourth Reader	0 40
High School Reader	0 50
Public School Arithmetic	0 25
Public School Algebra and Euclid	0 25
Public School Geography	0 75
Public School Grammar	0 25
Public School History of England and Canada	0 30
History of the Dominion of Canada Clement (for Fifth Form)	0 50
Public School Drawing Course, each Number	0 05
Public School Physiology and Temperance	0 25
Public School Copy Book—Casselman	0 07
Practical Speller—Gage	0 25
Public School Agriculture	0 30
Public School Domestic Science (optional)	0 50

French-English Readers.

First Reader, Part I	$0 10
First Reader, Part II	0 15
Second Reader	0 25
Third Reader	0 35

German-English Readers.

Ahn's First German Book	$0 25
Ahn's Second German Book	0 45
Ahn's Third German Book	0 45
Ahn's Fourth German Book	0 50
Ahn's First German Reader	0 50

High Schools and Collegiate Institutes. (Schedule B.)

English.

High School Reader	$0 50
High School English Grammar	0 75
High School English Composition	0 50
High School Composition from Models	0 75

History and Geography.

High School Geography	$1 00
High School History of England and Canada	0 65
High School History of Greece and Rome	0 75
History of the Dominion of Canada—Clement	0 50

Mathematics.

High School Arithmetic	$0 60
High School Algebra	0 75
Elements of Algebra, McLellan	0 75
High School Euclid (Books I., II., III., 50 cents)	0 75

Classics.

First Latin Book	$1 00
Primary Latin Book	1 00
High School Beginner's Greek Book	1 50

Moderns.

High School French Grammar	$0 75
High School French Reader	0 50
High School German Grammar	0 75
High School German Reader	0 50

Science.

High School Physical Science. Part I., 50 cents; Part II.	$0 75
High School Botanical Note Book, Part I., 50 cents; Part II	0 60
High School Botany, Part II	0 60
High School Chemistry	0 50

Bookkeeping and Drawing.

High School Bookkeeping (after 1st Jan., 1900, 60 cents)	$0 65
Authorized Bookkeeping Exercises and Blank Book	0 25
High School Drawing Course, each number	0 10

Cadet Drill.

High School Cadet Drill (optional)	$0 40

Training Schools. (Schedule C.)

County Model Schools.

School Management, Millar	$1 00
Methods in Teaching, Edited by Tilley	1 50
Public School Physiology and Temperance	0 25
Psychology applied to Teaching, Baldwin	1 50
Steps in the Phonic System, Cullin & Niven	0 50
Elementary Phonetics, Burt	0 35
Mental Arithmetic, McLellan & Ames	0 30
Algebraical Exercises, Barnes	0 30

Normal Schools.

Lectures on Teaching, Fitch	$1 00
School Management, Millar	1 00
Educational Reformers, Quick	1 50
Applied Psychology, McLellan	1 00
First Year at School, Sinclair	0 50
High School Cadet Drill Manual	0 40
Hints on Teaching Arithmetic, McLean	0 50
Public School Domestic Science	0 50

Ontario Normal College.

Applied Psychology, McLellan	$1 00
Education, Spencer	0 50
School Management, Millar	1 00
School Management, Landon	1 50
Educational Reformers, Quick	1 50
High School Cadet Drill Manual	0 40
Physical Culture, Houghton	0 50
Physical Education, McLaren, Part II., sections II. and III.	2 00

Teachers' Reading Course for 1900. (Schedule D.)

Study of the Child (Taylor)	$1 25
History of Education (Painter)	1 50
Canadian Citizenship (Millar)	0 60

Note.—Candidates for admission to the Normal Schools in August, 1900, and in January, 1901, will be examined on the Books in the Teachers' Reading Course as above

☞"Thomas and Matthew Arnold" (Fitch), in "The Great Educators" series may be substituted for Paynter's "History of Education."

The following work was inadvertently omitted from the list of books for County Model Schools:—"An Elementary Treatise on Arithmetic for use in Public and Model Schools of Ontario," by Wilson Taylor, B.A. (Price 50 cents.)

Toronto, August, 1899.

MEMORANDUM—COUNTY MODEL SCHOOLS.

Directions to Boards of Examiners.

1. The attention of Boards is directed to the provisions of Regulations (57-65) and to the information in the Model School Calendar.

2. If a Primary, Junior Leaving, or Senior Leaving Certificate is not presented, Regulations (45-49) will show the certificates that give the equivalent standing. It will be understood that a Form I., a Commercial or a District Certificate, is accepted in lieu

of a Public School Leaving Certificate, and that a Form II. Certificate or a Primary Certificate granted in 1896 covers a Part I. of Form II. Certificate.

3. It should be understood that County Boards of Examiners are not allowed to award Third-class Certificates to candidates who do not make the higher percentage required by Regulation 63. A District Certificate shall not be granted under this section of the Regulation unless there is a scarcity of teachers, and until the consent of the Department has been first obtained.

4. Renewals (Regulations 87) are now limited to the County and cannot be endorsed for another County. It is presumed that each Board will consider the interests of the schools of the County. If Renewals are granted the grounds in each case should be stated. The Renewals granted will include any certificates "extended" as provided for in the same Regulation. All applications for Renewals should be made to the Public School Inspector, who will bring requests of the kind before the County Board of Examiners.

5. It is recommended that a Renewal be granted, if requested, in the case of any certificate expired when the candidate made application to attend the Normal School, but was informed that no more students could be admitted on account of lack of accommodation.

6. It will be the duty of the Board (Regulation 59) to grant no certificate to a candidate who will not be 18 years of age before the first of January next.

7. Answer papers, with the Model School Principal's report, are to be retained by the Board. The former may be destroyed after the first of March following.

8. The Board is requested to fill out the Official Report with all details asked for, and to forward it to the Education Department *not later than* the 31st of December.

TORONTO, September, 1899.

AMENDMENTS TO REGULATIONS FOR 1900.

APPROVED AUGUST, 1899.

For the academic year 1899 1900, the following modifications are made in the *Revised Regulations which came into force in October, 1896:

PUBLIC SCHOOL COURSE OF STUDY.

The public School course of study is amended so as to include Agriculture among the obligatory subjects in all rural schools for Forms IV. and V., for the latter Form the text-books are to be used by the pupils, but for the former the instruction is to be by conversation only. Agriculture will remain optional for all Public Schools in urban municipalities. Needle-work, Domestic Economy, and Manual Training may be taken up in urban schools with the approval of the trustees. In Poetical Literature the course for Form V, will embrace such selections from the High School Reader as are recommended by the teacher. No special selections are prescribed by the Department. Where the trustees have provided books for Supplementary Reading, such works as are recommended by the teacher, under the direction of the Inspector, may also be read.

*A copy of the High and Public Schools Acts, including the Regulations, was sent in 1896 to each High, Public and Separate School Board; to each Principal of a Collegiate Institute or High School; to each Principal of a County Model School, and to each Public School Inspector. As only a limited supply of the Regulations can be furnished, reference should be made to the copies already sent as above mentioned. The selections in Literature for the High School Entrance examination have been printed in the school registers.

High School Course of Study.

The High School course of study is amended by making Bookkeeping obligatory, and by adding Agriculture and Manual Training to the list of optional subjects. In Poetical Literature for Forms I and II, no special texts are prescribed by the Department, but the pupils shall study such selections from the High School Reader as may be recommended by the Principal, together with such books for Supplementary Reading as he may recommend, and which may be obtained from the Library of the School. Any subject prescribed for a Form may be continued in a higher Form at the option of the Principal. In the case of pupils preparing for University Matriculation or taking the course for a Commercial Diploma, or where the Board introduces Manual Training or any other branch of technical education, on the recommendation of the Principal, less time may be given by the pupils concerned to one or more of the obligatory subjects of the High School course so as to meet as far as practicable the aims of the pupils.

Continuation Classes.

Under the provisions of the Amendment of 1899 to the Public Schools Act, the course of study (Regulation 20) for Continuation Classes is extended to include the subjects prescribed for Form II of the High School course. More advanced work of the High School may be taken up if requested by the Trustees and approved by the Public School Inspector. In Class (*a*) the Principal must give regular instruction only to pupils of Form V or to those doing higher work. In the other classes, the teachers must have such qualifications as are approved by the Public School Inspector.

Hereafter (Regulation 21) there will be four grades of Continuation Classes, viz.:— (*a*) Schools in which the Principal holds a First Class Certificate (unless occupying the position since April, 1899,) and gives regular instruction only to pupils of Form V or to those doing higher work. (*b*) Schools in which there are at least two teachers, and a class in regular attendance of at least ten pupils who have passed the High School Entrance examination. (*c*) Schools in which there at least five ; and (*d*) in which there are at least three, who have passed the High School Entrance examination, and are in regular attendance.

No grant will be paid for Continuation Classes unless the Inspector (who shall examine the statements signed, as hereinafter mentioned, by the Principals and Chairmen of the Boards) reports that the obligatory subjects, whether prescribed for examination purposes or not, have received proper attention. The grant will be paid according to the nature and extent of the work done, and not on the results of examinations. In order that a school may obtain the grant, it will be necessary that the minimum number of pupils be enrolled during each month of the full academic year ending in June.

High School Entrance Examination.

At the High School Entrance Examination the paper in Arithmetic will include such questions as will specially test the accuracy of the candidates in the simple rules, as well as their knowledge of the subject, and the paper in Dictation will call for the study of the authorized spelling book. In other respects the course prescribed, the number and values of the papers, and the mode of conducting the examination, will be the same as heretofore. (Regulations 23-27.)

Primary Standing.

No examination will be held in Part II of Form II, as defined in Regulation 43, and no certificates that give mere Primary standing (Regulations 45, 48 and 49) will be issued. Except as herein mentioned, and unless the classification should require, no change is made in the course to be taken up in Forms I and II of the High Schools, or for Continuation Classes in Public Schools, by the abolition of the Primary examination.

A Form II (or a Part I Form II) certificate, will give Part I of Junior Leaving Standing as hereinafter defined. The same certificate, alone, will give the same standing, if endorsed and certified to after June, 1900, by any High School Principal or Public School Inspector with a statement that the holder has taken the required course in the additional subjects (Drawing, Book-keeping, Reading, etc.), omitted as examination subjects in 1900.

Public School Leaving Examination.

The Public School Leaving examination will hereafter be identical with the examination prescribed for Part I, of the Junior Leaving Standing. Public School Leaving certificates will be issued by the Public School Inspector to all pupils of Public Schools in his inspectorate who pass the examination of Part I of Junior Leaving Standing. The present holders of Public School Leaving certificates will be entitled to certificates of having passed the examination of Part I of Junior Leaving Standing by passing the examinations in Arithmetic and Mensuration, Grammar and History, the prescribed percentage on the total of these subjects being also exacted.

Form I. Examination.

There will no longer be held examinations for the High School Form I, but holders of Form I. certificates will be entitled to certificates of having passed the examination of Part I. of Junior Leaving Standing by passing in the subjects of Arithmetic and Mensuration, Grammar and History, the prescribed percentage on the total of these subjects being also required.

District Certificates.

A certificate of having passed the subjects of Part I. of Junior Leaving Standing will be accepted for the non-professional requirements for a District Certificate. (Regulation 63.)

Junior Leaving Standing.

Hereafter Junior Leaving Standing will be obtained only by passing in the prescribed subjects at one examination, or in two Parts (I. and II.) as defined below, which may be taken in different years.

Unsuccessful candidates at any previous Junior Leaving examination will be allowed to write in 1900 for Junior Leaving Standing by selecting the same options as were allowed in 1899.

Part I., Junior Leaving Standing.

The subjects prescribed for Part I. of Junior Leaving Standing are the following : Reading, Drawing, Geography, Botany (or Agriculture), Writing with Book-keeping and Commercial Transactions, English Grammar, English Literature, Arithmetic and Mensuration, English Composition, and History. The course in Agriculture will include what is taken up in the authorized text book as far as page 73. The course in the other subjects will be based as heretofore upon the work prescribed in the Regulations for Forms I. and II., subject to requirements for examinations hereinafter mentioned. For 1900 no examinations will be held in Reading, English Literature, Drawing, Book-keeping, Botany or Agriculture, but no name of a student who has not given due attention to these subjects is to be included in the confidential report of the Principal.

No grant to a High School or to a Continuation Class will be paid until the Principal and Chairman of the School Board report that each obligatory subject of the course, whether prescribed for examinations or not, has, in their judgment, received due attention on the part of the pupils while attending school.

It is expected that throughout the course, until pupils have completed what is required for Part I. of Junior Leaving Standing, at least two half-hour periods per week shall be given regularly to Reading, and an equal time to English Literature. Regarding Drawing, Book-keeping, Botany or Agriculture, at least two half-hour periods per week for each of these subjects are to be given regularly to pupils enrolled in Form I. of the High School or Form V. of the Public School; that is practically during the first year of the course in preparation for Part I. of Junior Leaving Standing.

Examination Requirements.

(*Part I, Junior Leaving Standing.*)

Geography.

The building up of the earth; its land surface; the ocean; comparison of continents as to physical features, natural products and inhabitants; relations of physical conditions to animals and vegetable products, and of natural products and geographical condition to the occupations of the people and national progress. Form, size and motions of the earth; lines drawn on the map, with reasons for their position; relation of the positions of the earth with respect to the sun, to light and temperature; the air; its movements; causes affecting climate. Natural and manufactured products of the countries of the world, with their exports and imports; transcontinental commercial highways and their relation to centres of population; internal commercial highways of Canada and the chief internal commercial highways of the United States; commercial relations of Great Britain and her colonies. Forms of governments in the countries of the world and their relation to civilization. One examination paper.

Arithmetic and Mensuration.

Proofs of elementary rules in Arithmetic; fractions (theory and proofs); commercial Arithmetic; mental Arithmetic; Mensuration of rectilinear figures. One examination paper. (The questions will call for accuracy and will have special reference to the requirements of ordinary life).

English Grammar.

Etymology and Syntax, including the inflection, classification, and elementary analysis of words and the logical structure of the sentence and paragraph; exercises chiefly on passages from authors not prescribed. One examination paper. (The questions will call for such an elementary knowledge of the subject as will be of special value in the ordinary use of the language).

English Composition.

For examination purposes an essay of about two pages of foolscap on one of the themes prescribed by the examiners will be required. The penmanship, spelling, punctuation, construction of sentences, the logical arrangement of the thought, the literary accuracy and aptness of the language, and the general plan or scope of the whole essay will be especially considered by the examiners. One examination paper.

History of Great Britain and Canada.

Great Britain and Canada from 1763 to 1885, with the outlines of the preceding periods of British History.

The Geography relating to the History prescribed. One examination paper.

Part II., Junior Leaving Standing.

The subjects prescribed for Part II. of Senior Leaving Standing are the following Regulations 46 amended): English Grammar and Rhetoric, English Composition, English Literature, Ancient History, Arithmetic and Mensuration, Algebra, Geometry, Physics

and Latin, and one of the following groups :—(a) French and Greek ; (b) German and Greek ; (c) French, German and Chemistry ; (d) French, Physics and Chemistry ; (e) German, Physics and Chemistry ; (f) Botany, Physics and Chemistry.

A candidate, who has already obtained a certificate of having passed Part I. of Form II., will not be required to take the papers in Arithmetic and Mensuration, English Grammar and Rhetoric, and the obligatory Physics.

Examination Requirements.

(Part II., Junior Leaving Standing.

English.

English Grammar and Rhetoric : Etymology and Syntax, including the inflection, classification and elementary analysis of words, and the logical structure of the sentence ; rhetorical structure of the sentence and paragraph : exercises chiefly on passages from authors not prescribed ; the main facts in the development of the language. One examination paper.

Composition : An essay, to which special importance will be attached, on one of several themes set by the examiners. In order to pass in this subject, legible writing, correct spelling and punctuation, and proper construction of sentences are indispensable. The candidate should also give attention to the structure of the whole essay the effective ordering of the thought, and the accurate employment of good English vocabulary.

About two pages of foolscap is suggested as the proper length for the essay ; but quality, not quantity, will be mainly regarded. One examination paper.

Literature : Such questions only shall be set as may serve to test the candidate's familiarity with, and intelligent and appreciative comprehension of the prescribed texts. The candidate will be expected to have memorized some of the finest passages. In addition to the questions on the prescribed selections, others shall be set on a "sight passage" to test the candidate's ability to interpret literature for himself. One examination paper.

1900.

Longfellow : Evangeline. A Psalm of Life, Wreck of the Hesperus, "The Day is Done," The Old Clock on the Stairs, The Fire of Driftwood, Resignation, The Warden of the Cinque Ports, Excelsior, The Bridge, A Gleam of Sunshine.

Wordsworth : The Education of Nature ("Three years she grew"), "She was a phantom of delight,' A Lesson ("There is a flower, the Lesser Celandine"), To the Skylark, The Green Linnet, To the Cuckoo, To the Daisy, and the following Sonnets, To a Distant Friend ("Why art thou silent"), England and Switzerland ("Two voices are there"), "Milton, thou shouldst be living at this hour," Westminster Bridge, The Inner Vision ("Most sweet it is, with unuplifted eyes"), "O Friend ! I know not which way I must look," To Sleep, Within King's College Chapel.

1901.

Tennyson : Elaine, Lady of Shalott, St. Agnes' Eve, Sir Galahad, Lotos-Eaters, Ulysses, Crossing the Bar, Early Spring, "You ask me why," "Of old sat Freedom," "Love thou thy land," the six interlude songs and "Tears, idle tears," in "The Princess."

1902.

Scott : Lay of the Last Minstrel.

Ancient History.

(1) General outlines of Greek History to the Battle of Chæronea, 338 B.C.

(2) General Outlines of Roman History to the Death of Augustus, authorized text-book, omitting :—

(1) Greek History—Chaps. II., III., VI., VII., XI., XII., XXIV., XXX., XXXI.

(2) Roman History—Chap. II., III., IV., V., XXIX.

NOTE—It is desirable, however, that the teacher make oral use of such portions of the omitted chapters as are necessary to make clear the historical connections between important events.

One examination paper.

Mathematics.

ARITHMETIC AND MENSURATION. Proofs of elementary rules in Arithmetic: fractions (theory and proofs); commercial Arithmetic; mental Arithmetic; Mensuration of right parallelopipeds, pyramids and prisms; the circle, sphere, cylinder and cone. One examination paper.

ALGEBRA: Elementary Rules; Highest Common Measure; Lowest Common Multiple; Fractions, Square Root; Simple Equations of one, two and three unknown quantities; Indices; Surds; Quadratics of one and two unknown quantities.

One examination paper.

GEOMETRY; Euclid, Books I., II., and III,; easy Deductions.

One examination paper.

Elementary Experimental Science (Physics).

Use of metre rule; use of calipers and vernier for more accurate metric measurements (*e. g.*, diameters of wires, thickness of glass, plates, etc); numerical calculations in the metric system.

Use of balance.

Specific gravity, by specific gravity bottle and hydrostatics balance, of liquids and of solids.

Boyle's law; barometer; diffusion of gases.

Use of Fahrenheit and Centigrade thermometers; determination of zero and boiling point; boiling point dependent on pressure.

Expansion of solids, liquids and gases; examples.

Specific heat; latent heat; easy numerical examples.

Transmutation of matter; indestructibility of matter.

Solution, precipitation, crystallization and evaporation.

One examination paper.

Latin.

Translation into Latin of English phrases and easy sentences to illustrate Latin accidence and the common rules of Latin syntax.

Translation into Latin of easy narrative English based upon the first twenty-five chapters of the prescribed Cæsar.

Translation at sight (with the aid of vocabularies) from some easy prose author.

Translation from prescribed texts, with grammatical and other questions naturally arising from the extracts set for translation.

The following are the texts prescribed:—

1900: VERGIL, Aeneid, Bk. II; CAESAR, Bellum Gallicum, Bk. V.

1901: VERGIL, Aeneid, Bk. II; CAESAR, Bellum Gallicum, Bks. II, III.

1902: CORNELIUS NEPOS, Lives of Themistocles, Aristides and Hannibal; CAESAR, Bellum Gallicum, Bk. IV (omitting Chap. 17) and Bk. V. Chaps. 1-23; VERGIL, Aeneid, Bk. II (1-505).

Two papers will be set: (1) Translation of English into Latin, (2) Prescribed texts and translation at sight, with questions on Grammar, etc.

N. B.—The Roman method of pronouncing Latin is recommended.

French.

The candidate's knowledge of French will be tested by: (1) simple questions on grammar, (2) the translation of simple passages from English into French, (3) translation at sight of easy passages from modern French and (4) and examinations on the following texts:—

1900: ENAULT, le Chien du capitaine; FEUILLET, la Fée.

1901: DE MAISTRE, Voyage autour de ma chambre; LABICHE, la Grammaire.

1900: LAMENNAIS, Paroles d'un croyants, Chaps. VII and XVII; PERRAULT, le Maitre Chat ou le Chat Botté; DUMAS, Un nez gelé, and la Pipe de Jean Bart; ALPHONSE DAUDET, la Derniére classe, and la Chévre de M. Seguin; LEGOUVÈ, la Patte de dindon; POUVILLON, Hortibus, LOTI, Chagrin d'un vieux forcat; MOLIÈRE, l'Avare, Acte III, sc. 5 (Est ce à votre cocher . . . sous la mienne). VICTOR HUGO, Waterloo, Chap. IX; ROUGET DE L'ISLE, la Marseillaise; ARNAULT, la Feuille; CHATEAUBRIAND, l'Exilé; THÉOPHILE GAUTIER, la Chimére; VICTOR HUGO, Extase; LAMARTINE, l'Automne; DE MUSSET, Tristesse; SULLY PRUDHOMME, le Vase brisé; LA FONTAINE, le Chêne et le Roseau.

MADAME EMILE DE GIRARDIN, la Joie fait peur.

Two papers will be set; (1) prescribed texts and translation at sight; questions on Grammar; (2) the translation of English into French.

Greek.

Translation into English of passages from prescribed texts.

Translation at sight (with the aid of vocabularies) of easy Attic prose to which special importance will be attached.

Grammatical questions on the passages from prescribed texts will be set, and such other questions as arise naturally from the context.

Translation from English into Greek of sentences and of easy narrative passages based upon the prescribed prose texts.

The following are the prescribed texts:

1900: Selections from XENOPHON, Anabasis I, in White Beginner's Greek Book (pp. 304-428) with the exercises thereon; HOMER, Iliad I.

1901: Selections frem XENOPHON, Anabasis I, in White Beginner's Greek Book (pp. 304-428) with the exercises thereon; HOMER, Iliad I.

1902; Selections from XENOPHON, Anabasis I, in White's Beginner's Greek Book (pp. 304-428) with the exercises thereon, HOMER, Iliad VI.

Two papers will be set: (1) prescribed texts and translation at sight; questions on Grammar; (2) the translation of English into Greek.

German.

The candidate's knowledge of German will be tested by: (1) simple questions on grammar, (2) the translation of simple passages from English into German, (3) translation at sight of easy passages from modern German, and (4) an examination on the following texts:—

1900: HAUFF, das kalte Herz, Kalif Storch.

1901: LEANDER, Träumereien (selected by Van Daell).

1902: GRIMM, Rotkäppchen; ANDERSON, Wie's der Alte macht, Das neue Kleid, Venedig, Rothschild, Der Bar, ERTL, Himmelssahlussel; FROMMEL, Das eiserne Kreuz;

BAUMBACH, Nicotiana. Der Goldbaum; HEINE, Lorelei. Du bist wie eine Blume; UHLAND, Schafer's Sonntagslied. Das Schloss am Meer; CHAMISSO, Das Schloss Boncourt, CLAUDIUS, Die Sterne, Der Riese Goliath; GOETHE, Mignon, Erlkönig, Der Sanger; SCHILLER, Der Jüngling am Bache.

LEANDER, Traumereien (selected by Van Daell), pp. 1-44.

Two papers will be set: (1) prescribed texts and translation at sight; questions on Grammar; (2) the translation of English into German.

Elementary, Experimental Science (Chemistry.)

Properties of Hydrogen, Chlorine, Oxygen, Sulphur, Nitrogen, Carbon and their more important compounds. Nomenclature. Laws of combination of the elements. The Atomic Theory and Molecular Theory.

One Examination paper.

Botany.

The practical study of representatives of the flowering plants of the locality and representatives of the chief subdivisions of cryptogams, such as a fern, a lycopod, a horsetail, a liverwort, a moss, a lichen, a mushroom and a chara. The drawing and description of parts of plants and classification. Comparison of different organs, morphology of root, stem, leaves and hair, parts of the flower, reproduction of flowering plants, pollination, fertilization and the nature of fruit and seeds. At the examination two plants to be selected by the presiding examiner will be submitted, one for classification and one for description. In classification, candidates will be allowed to use their floras (the authorzed text-book in Botany).

One examination paper.

Physics (of Optional Group.)

ELECTRICITY.—Voltaic cells, common kinds; chemical action in the cell; magnetic effects of the current; chemical effects of the current; voltameter; astatic and tangent galvanometers; simple notions of potential; Ohm's law, with units; best arrangement of cells; electric light, arc and incandescent; magnetism; inclination and declination of compass; current induction; induction coil; dynamo and motor; electric bell; telegraph; telephone; electro-plating. SOUND.—Caused by vibrations; illustration of vibrations, pendulums, rods, strings, membranes, plates, columns of air; propagated by waves; its velocity; determination of velocity; pitch; standard forks, acoustical C = 512, musical, A = 870; intervals; harmonic scale; diatonic scale; equally tempered scale; vibration of air in open and closed tubes, with wave-lengths; resonators: nodes and loops; vibration of strings and wires; reflection of sound; manometric flames. LIGHT.—Rectilinear propagation; image through a pin hole; beam; pencil; photometry; shadow and grease spot photometers; reflection and scattering of light; laws of reflection; images in plain mirrors; multiple images in inclined mirrors; concave and convex mirrors; drawing images refraction; laws and index of refraction; total reflection; path through a prism; lenses; drawing image produced by a lens; simple microscope; dispersion and color; spectrum; recomposition of white light.

One examination paper.

SENIOR LEAVING STANDING.

In order to obtain Senior Leaving Standing, a candidate must pass the examination of Part I of Junior Leaving Standing, and in addition the subjects herein prescribed for Parts I and II of Senior Leaving Standing, which may be taken at one examination or at different examinations.

Unsuccessful candidates at any previous Senior Leaving Examination will be allowed to write in 1900 for Senior Leaving Standing by selecting the same options in the course as they were allowed to take in 1899.

Part I, Senior Leaving Standing.

The subjects of Part I of Senior Leaving Standing are the following:—English Composition, English Literature, Algebra, Geometry, Trigonometry, English and Ancient History.

Examination Requirements.

(Part I. Senior Leaving Standing).

English.

Composition: An essay, to which special importance will be attached, on one of several themes set by the examiner.

One examination paper.

Literature: The candidate will be expected to have memorized some of the finest passages. Besides questions to test the candidate's familiarity with, and comprehension of, the following selections, questions may also be set to determine within reasonable limits his power of appreciating literary art.

Rhetoric: Reading of prose authors in connection with the study of rhetoric.

One examination paper.

1900.

Longfellow: Evangeline, A Psalm of Life, Wreck of the Hesperus, "The day is done," The Old Clock on the Stairs, The fire of driftwood, Resignation, The Warden of the Cinque Ports, Excelsior, The Bridge, A Gleam of Sunshine.

Shakespeare: Macbeth.

Milton: L'Allegro, Il Penseroso, Lycidas, On the Morning of Christ's Nativity.

Wordsworth: (Palgrave's Golden Treasury of Songs and Lyrics) The Education of Nature ("Three years she grew"), "She was a Phantom of Delight," A Lesson ("There is a flower, the Lesser Celandine"), To the Skylark, The Green Linnet, To the Cuckoo, To the Daisy, and the following Sonnets, To a Distant Friend ("Why art thou silent," England and Switzerland ("Two voices are there.") "Milton, thou shouldst be living at this hour," Westminster Bridge, The Inner Vision ("Most sweet it is with unuplifted eyes,") "O Friend! I know not which way I must look," To Sleep, Within King's College Chapel

1901.

Tennyson. Elaine, Lady of Shalott, St. Agnes' Eve, Sir Galahad, Lotos-Eaters, Ulysses, Crossing the Bar, Early Spring, "You ask me why," "Of old sat Freedom," "Love thou thy land," the six interlude songs and "Tears, idle tears," "The Princess."

Milton: Paradise Lost, Book, VII.

Shakespeare? Julius Cæsar.

1902.

Scott: Lay of the Last Minstrel.

Milton: Paradise Lost, Book I.

Shakespeare: The Merchant of Venice.

Mathematics.

Algebra: Elementary Rules, Highest Common Measure; Lowest Common Multiple; Fractions; Square Root; Simple Equations of one, two and three unknown quantities; Indices; Surds; Quadratics of one and two unknown quantities: Theory of Divisors

Ratio, Proportion, and Variation; Progressions; Notation; Permutations and Combinations; Binomial Theorem; Interest Forms; Annuities.

One examination paper.

Geometry: Euclid, Books I, II, III, IV, and V; Definitions of Book V; Deductions.

One examination paper.

Trigonometry: Trigonometrical ratios with their relations to each other; Sines, etc., of the sum and difference of angles with deduced formulas; Use of Logarithms; Solution of Triangles; Expressions for the area of Triangles; Radii of circumscribed, inscribed, and escribed circles.

One examination paper.

History.

English History from the discovery of America to 1763.

General outlines of Greek History to the battle of Chæronea, 338 B. C. Special attention to be paid to the following: General characteristics of Greece and the Greeks; ancient institutions; constitution of Athens and Sparta; Persian wars; growth of the Athenian Empire; characteristics of the age of Pericles; Peloponnesian wars; rise of Thebes; Theban Supremacy; rise of Macedon; downfall of Greece.

General outlines of Roman History to the death of Augustus. Special attention to be given to the following: General characteristics of Italy and the Roman People; struggle of the Plebeians for political and social equality; conquest of Italy; Punic wars; how Rome governed and was governed; internal and external history of Rome from the downfall of Carthage to the death of Augustus.

The Geography relating to the History prescribed.

One examination paper.

Part II, Senior Leaving Examination.

The subjects of Part II of Senior Leaving Standing are the following:—Physics, Latin, and one of the following groups:—(a) French and Greek, (b) German and Greek, (c) French and German, (d) French and Chemistry, (e) German and Chemistry, (f) Biology and Chemistry.

Examination Requirements.

(Part II, Senior Leaving Standing.

Physics.

Mechanics: Measurement of velocity; uniformly accelerated rectilineal motion; metric units of force, work, energy and power; equilibrium of forces acting at a point; triangle, parallelogram, and polygon of forces; parallel forces; principle of moments; centre of gravity; laws of friction; numerical examples.

Hydrostatics: Fluid pressure at a point; pressure on a horizontal plane; pressure on an inclined plane; resultant vertical pressure, and resultant horizontal pressure, when fluid is under air pressure and when not; transmission of pressure; Bramah's press; equilibrium of liquids of unequal density in a bent tube; the barometer; air-pump; water-pump, common and force; siphon.

Electricity: Voltaic cells, common kinds; chemical action in the cell; magnetic effects of the current; chemical effects of the current; volta-meters; electroplating; astatic and tangent galvanometers; simple notions of potential; Ohm's law; shunts; measurement of resistance; electric light, arc and incandescent; current induction; induction coil; dynamo and motor; the joule and watt; electric bell; telegraph; telephone; elements of terrestrial magnetism.

One examination paper.

Latin.

Translation into English of passages from prescribed texts.

Translation at sight of passages of average difficulty, similar in style to the authors read.

Grammatical questions on the passages from prescribed texts will be set, and such other questions as arise naturally from the context.

Translation into Latin of easy passages of English, similar in style to the authors read.

The following are the prescribed texts :—

1900 : Caesar, Bellum Gallicum, Bk. V.; Vergil, Aeneid, Bk. II ; Horace, Odes, III. IV ; Livy XXI.

1901 : Caesar, Bellum Gallicum, Bks. II, III ; Vergil, Aeneid, Bk. II ; Horace Odes, I, II ; Livy XXI.

1902 : Caesar : Bellum Gallicum, Bk. IV, omitting Chap. 17, and Bk. V, Chaps. 1-23 ; Vergil, Aeneid II, lines 1-505 ; Horace, Odes I, II ; Cicero, Pro Lege Manilia, Pro Marcello, Philippic XIV.

Two examination papers.

The prescription of work in grammar, the translation of English into French and sight translation is the same for Senior Leaving Standing as for Junior Leaving Standing, but the examination will be of a more advanced character.

The following are the prescribed texts :—

1900 : Enault : la Chien du capitaine ; Feuillet, la Fée, le Roman d'un jeune Homme pauvre ; Labiche, Voyage de M. Perrichon.

1901 : De Maistre, Voyage autour de ma chambre ; Labiche, la Grammaire ; Erckmann-Chatrian, Madame Thérèse ; Labiche, le Poudre aux yeux.

1902 : Lamennais, Paroles d'un croyant, Chaps. VII and XVII ; Perrault, le Maître Chat ou le Chat Botté ; Dumas, Un nez gelé and la Pipe de Jean Bart ; Alphonse Daudet, la Dernière classe and la Chèvre de M. Seguin ; Legouvé la Patte de dindon ; Pouvillon, Hortibus ; Loti, Chagrin d'un vieux forcat ; Molière, L'Avare, Acte III, sc 5 (est-ce á votre cocher . . . . sous la mienne) ; Victor Hugo, Waterloo, Chap IX ; Rouget de L'Isle, la Marseillaise ; Arnault. la Feuille ; Chateaubriand, L'Exilé ; Théophile Gautier, la Chimère ; Victor Hugo, Extase ; Lamartine, l'Automne ; De Musset, Tristesse ; Sully Prudhomme, le Vase brisé ; La Fontaine, le Chêne et le Roseau.

Madame Emile de Girardin, la Joie fait peur.

Mérimée, Colomba.

Two examination papers

Greek.

Translation into English of passages from prescribed texts.

Translation at sight of passages of average difficulty, similar to the authors read.

Grammatical questions on the passages from prescribed texts will be set, and such other questions as arise naturally from the context.

Translation into Greek of ordinary narrative passages of English, similar to the authors read.

The following are the prescribed texts :

1900 ; Xenophon, Anabasis, I (Chaps I-VIII); Homer, Iliad, I, Odyssey XV Lysias, Contra Eratosthenem, and Epitaphius.

1901: Xenophon, Anabasis, I (Chaps I-VIII); Homer, Iliad I, Odyssey XV; Lucian, Charon, Vera Historia II.

1892: Xenophon, Anabasis I (Chaps. I-VIII); Homer, Iliad VI; Odyssey XVII; Lucian, Charon, Vera Historia II.

Two examination papers.

German.

The prescription of work in grammar, the translation of English into German and sight translation is the same for Senior Leaving Standing as for Junior Leaving Standing, but the examination will be of a more advanced character.

The following are the prescribed texts:—

1900: Hauff, das kalte Herz, Kalif Storch; Eichendorff, Aus dem Leben eines Taugenichts; Wilhelmi, Einer muss heiraten; Benedix, Eigensinn.

1901: Leander, Träumereien (selected by Van Daell); Baumbach der Schwiegersohn; Gerstacker, Germelshausen; Elz, Er ist nicht eifersüchtig; Wichert, Post Festum.

1902: Grimm, Rotkäppchen; Andersen, Wie's der Alte macht, Das neue Kleid, Venedig, Rothschild, Der Bär; Ertl, Himmelsschlüssel; Frommel, Das eiserne Kreuz; Baumbach, Nicotiana, Der Goldbaum; Heine, Lorelei, Du bist wie eine Blume; Uhland, Schäfer's Sonntagslied, Das Schloss am Meer; Chamisso, Das Schloss Boncourt; Claudius Die Sterne, Der Riese Goliath; Goethe, Mignon, Erlkönig, Der Sänger; Schiller, Der Jüngling am Bache.

Leander, Träumereien (selected by Van Daell), pp. 1-44.

Ebner-Eschenbach, Die Frieherren von Gemperlein; Wilhelmi Einer muss heiraten.

Benedix, Eigensinn.

Two examination papers.

Chemistry.

Chemical Theory. The study of the following elements, with their most characteristic compounds, in illustration of Mendelejeff's Classification of the Elements: Hydrogen; Sodium, Potassium; Magnesium, Zinc; Calcium, Strontium, Barium; Boron, Aluminium; Carbon, Silicon, Tin, Lead; Nitrogen, Phosphorus, Arsenic, Antimony, Bismuth; Oxygen, Sulphur; Fluorine, Chlorine, Bromine, Iodine; Manganese, Iron. Elementary Qualitative Analysis.

A practical examination shall be held in connection with the subject, a pure salt will be sent out for qualitative analysis, and the candidate shall be allowed the use of an analytical table. One examination paper.

Biology

1. *Elements of Zoology*: Thorough examination of the external form, the gills, and the viscera of some common fish. Study of the prepared skeleton of the same. Demonstration of the arrangement of the muscular and nervous systems and the sense-organs, as far as these can be studied without the aid of the microscope.

Comparison of the structure of the frog with that of the fish. The skeleton of the pectoral and pelvic girdles and of the appendages of the frog, should be studied, and the chief facts in the development of its spawn till the adult form is attained should be observed.

Examination of the external form of a turtle and a snake.

Examination of the structure of a bird.

Study of the skeleton, and also of the teeth of a cat or dog.

Study of the crayfish as a type of the Arthropods.

Comparison of the crayfish with an insect (grasshopper, cricket, or cockroach); also with a millipede and a spider.

Examination of an earthworm.

Study of a fresh-water mussel.

The principles of zoological nomenclature as illustrated by some of the common fresh-water fish, such as the sucker and the herring, bass and perch.

Study of an amœba, or paramœcium as a type of a unicellular animal.

The modifications of the form of the body in vertebrates in connection with different methods of locomotion. The natural habits of the various animals examined.

2. *Elements of Botany*: The examination will test whether the candidate has practically studied representatives of the flowering plants of the locality in which the preparatory school is situated, and representatives of the chief subdivisions of cryptogams, such as a fern, a lycopod, a horsetail, a liverwort, a moss, a lichen, a mushroom, and a chara.

An elementary knowledge of the microscopic structure of the bean and the maize. Attention will be given in the examination to drawing and description of parts of plants supplied, and to their classification. Comparison of different organs, morphology of root, stem, leaves and hair, parts of the flower, reproduction of flowering plants, pollination, fertilization, and the nature of fruit and seeds.

A practical examination shall be held in connection with this subject. The material for examination will consist of two plants, a microscopic section and an animal.

Two examination papers.

Question Papers.

The papers in Part I for Junior Leaving Standing will be different from those set for Matriculation. The Examiners will be expected moreover, to set papers for the purposes of candidates who desire to become teachers, but it is not intended that the questions shall be more difficult than the Regulations have called for since 1896. The papers in Arithmetic and Mensuration and Grammar and Rhetoric, as hereinbefore mentioned, shall be submitted to candidates, when writing on Part II of the Junior Leaving Course, in addition to the papers in these subjects taken by candidates when writing on Part I. For the optional groups, the examinations will be equal in difficulty, as near as may be, in order that candidates who begin the optional subjects at the same time during their High School course may have equal advantages in preparing for the examinations.

Percentages.

Each question paper will hereafter be valued at 100 (Regulation 43). Candidates for Junior and Senior Leaving Standing will be required to make 50 per cent. of the aggregate marks prescribed for each of the parts into which the examinations are divided, as well as $33\frac{1}{3}$ per cent. on each paper. Seventy-five per cent. of the aggregate will be required for Honors. If, after all the answer papers are read, any question paper should be found, by the Board of Examiners, easier or more difficult than intended, the minimum on the paper shall be correspondingly raised or lowered, and the total number of marks correspondingly raised or diminished. Each candidate who makes the required aggregate may be awarded a certificate, even though he should fail to obtain the minimum in a subject, provided he was regarded as fit to pass in that subject by the staff, as shown from the confidential report sent to the Department before the examinations.

Commercial Diploma.

The course for a Commercial Diploma will, as heretofore, consist of two Parts (I and II). Part I will be the same as Part I of Junior Leaving. Part II will embrace

the Commercial subjects mentioned in Regulation 50, viz :—Bookkeeping and Writing ; Commercial Transactions, Business forms and usages ; Stenography (Theory) ; Stenography (Dictation). Bookkeeping shall be taken up in six sets as follows :—

Set I shall show transactions extending over a period of two months ; the transactions of the first month being done by Single Entry, and of the second by Double Entry, and showing the change from Single to Double Entry. Books to be used : Day Book (1st month), Journal Day Book (2nd month), Cash Book, Bill Book, and Ledger.

Set II. The transactions shall be the same as for Set I., those of the first month being done by Double Entry, and of the second month by Single Entry, and showing the change from Double Entry to Single Entry. Books to be used : Four Column Journal with special columns for Mdse. Purchases and Sales (1st month), Day Book (2nd month), Cash Book, Bill Book and Ledger.

Set III. A Double Entry set with two partners. Books to be used : Journal Day Book with a special column for Mdse. Sales, Cash Book, Invoice Book, Bill Book, and Ledger, the first three as books of original entry.

Set IV. A Double Entry set ; a continuation of Set III., the posting being done in the same ledger. A third partner shall be admitted and the transactions shall include shipments and consignments. Books to be used : Journal Day Book, Cash Book, Invoice Book, Sales Book, Bill Book, and Ledger, the first four as books of original entry.

Set V. A Double Entry set : a continuation of Set IV., the posting being done in a new ledger. A fourth partner shall be admitted, and the transactions shall include wholesale merchandising, shipment companies, and merchandise companies. Books to be used : The same as for Set IV.

Set VI. A set in Manufacturing. Books to be used : Journal Day Book, with a special column for Mdse. Sales, Cash Book, Time Book, and Ledger.

The Cash Book shall be a book of original entry in all of the Double Entry sets, various special columns being used in the different sets. A monthly Trial Balance shall be used in connection with Sets III., IV., and V., and Statements of Resources and Liabilities, and of Losses and Gains for all of the sets. The transactions in the different sets shall be different from year to year. The sets may recur tri-ennially, and shall consist of not less than twenty pages of foolscap.

The book-keeping sets of pupils who write at the examination for a Commercial Diploma shall be examined by the teacher and a report sent to the Education Department.

Business Forms and Usages.— Negotiable paper ; promissory notes ; special notes ; bills of exchange ; acceptance ; negotiation of bills, notes ; cheques ; collection of accounts ; discharge and dishonor ; special forms of due bills and orders ; accounts, invoices and statements ; interest ; partnerships ; receipts and releases ; banking ; and commercial correspondence.

Stenography.—At the examination in dictation in stenography, the candidate shall be required to have attained the rate of fifty words per minute. He shall also be required to transcribe his work into longhand at the rate of twelve words per minute. The dictated matter shall consist of business letters and legal documents.

Four examination papers, each valued at 100.

County Model Schools.

The abolition of the Primary examinations will not affect the rights of the holders of Primary standing obtained in 1898, or a previous year, to attend County Model Schools. It should be understood that County Boards of Examiners are not allowed to award Third Class certificates to candidates who do not make the higher percentage required by Regulation 63. A District Certificate shall not be granted under this section of the Regulations unless there is a scarcity of teachers, and until the consent of the Department

has been first obtained. Renewals, granted under Regulation 87, are valid only in the county where issued. Beginning with the examinations of the Model Schools in 1900, an additional paper in Methods will be submitted to test the ability of the students-in-training to teach Drawing, Writing, Bookkeeping and Elementary Science (Botany or Agriculture). There will also be an examination in Reading.

Normal College.

All students entering the Normal College, irrespective of the academic course which they may have taken, must take the subjects preseribed in Regulation 80, subject to the following conditions :—

(1) Holders of Senior Leaving Certificates, granted on Departmental examinations, may omit Latin if they do not select the Greek option.

(2) Unsuccessful candidates at previous examinations will be allowed to write at the final examination of any year without attendance at the Normal College, and may confine themselves to the same subjects as taken previously.

Teachers of ten years' successful experience, who hold Normal School Certificates, and who have the necessary academic standing, may write at the final examination of the Normal College without attendance.

Any person graduating with Honors from any University in the British Dominions, who has spent two years as a registered student in postgraduate work in any British, European or other University approved by the Minister of Education, may write at the final examination of the Normal College without attendance, on furnishing satisfactory evidence of having taken such postgraduate course.

Instruction to Examiners.

The instructions issued, under the provisions of Regulation 109, may modify some minor provisions of the Regulations, more especially so far as refer to the conduct of the examinations. Any modifications of this nature will not, however, affect the course of study prescribed, or materially modify the provisions herein mentioned.

Toronto, Aug., 1899.

DEPARTMENTAL EXAMINATIONS.

1901 and 1902.

The courses for the examinations for Junior and Senior Leaving Standing for 1901 and 1902 will be the same as those prescribed for 1900, except that the following will be the requirements for Part II. Junior Leaving Standing: English Grammar and Rhetoric, English Composition, English Literature, Ancient History, Arithmetic and Mensuration, Algebra, Geometry, Physics (of the High School Course, Forms II. and III.), Latin, and one of the following subjects: (*a*) Greek, (*b*) French, (*c*) German, (*d*) Chemistry.

There will be no separate written examination in the Physics of Form II., but the examination in Physics, while mainly confined to the course in that subject as outlined for Form III., will also assume that the candidate possesses a competent knowledge of the Physics of Form II. As already provided, the Physics of Form II. may be taught in that Form or in Form III. at the option of the Principal.

All candidates, irrespective of any former Regulations, must comply with the requirements herein prescribed for the examinations of Junior Leaving Standing or Senior Leaving Standing. In other words, the special privileges allowed certain candidates for several years to write under the provisions of the Regulations in force before 1896 will not be continued after 1900.

Toronto, October, 1900.

It should be understood that certificates for Matriculation purposes have no value for Junior or Senior Leaving Standing. Supplemental examinations, which are held by the Universities, have no recognition for Departmental Certificates. Enquiries regarding the courses for Matriculation should be addressed to the Registrars of the Universities. Information respecting the courses for Matriculation in Medicine, Law, Dentistry, Pharmacy, etc., should be sought from the Secretaries of the bodies concerned.

Circular to Members of Municipal Councils and School Boards.

I wish to call your attention to the provisions of an Amendment to the Public Schools Act, passed at the last Session of the Legislative Assembly, and assented to the 1st of April, 1899. This Statute, entitled "An Act to improve the laws respecting Public Schools, in Sub-sections 1, 2 and 3 of Section 13 gives important powers to Municipal Councils and Trustee Boards. The section of the Act reads as follows :—

13.—"(1) The council of every municipality may, subject to the Regulations of the Education Department, employ one or more persons holding the degree of Bachelor of the Science of Agriculture or a certificate of qualification from the Ontario Agricultural College, to give instruction in Agriculture in the separate, public and high schools of the municipality, and the council shall have power to raise such sums of money as may be necessary to pay the salaries of such instructors, and all other expenses connected therewith. Such course of instruction shall include a knowledge of the chemistry of the soil, plant life, drainage, the cultivation of fruit, the beautifying of the farm, and generally all matters which would tend to enhance the value of the products of the farm, the dairy and the garden.

"(2) The trustees of any public, separate or high school or any number of boards of such trustees, may severally or jointly engage the services of any person qualified as in the preceding section for the purpose of giving similar instruction to the pupils of their respective schools, providing always that such course of instruction shall not supersede the instruction of the teacher in charge of the school, as required by the regulations of the Education Department.

"(3) As far as practicable, the course of lectures in agriculture by such temporary instructor shall occupy the last school period of each afternoon, and shall be open to all residents of the school section or municipality."

By the late amendments to the Regulations of the Education Department, the programme of study for Public Schools has been amended so as to make Agriculture a compulsory subject in all rural schools. This addition to the course of study will enable the pupils of all country districts to gain some valuable though elementary knowledge of what must necessarily concern a farming community. As may be expected, the information gained by means of the instruction given by the teachers and by the study of the authorized text-book, will necessarily be limited, in view of the age of the pupils. At the same time, their minds will be prepared to take a deeper interest than they otherwise would do in matters concerning the most important industry of the Province. The provisions of the sections of the Amendment quoted will show that the local authorities are now vested with power to supplement largely the instruction gained in the Public Schools. It is well understood that a keener interest in agricultural matters has been fostered by means of Farmers' Institutes. I wish to urge upon all persons concerned the importance of taking advantage of the provisions of the late Amendment to the Statute, in order to continue in a more advanced form that instruction in Agriculture, the foundations for which are laid in all our rural schools.

Toronto, November, 1899.

Circular to Officers of Public Libraries.

I am instructed by the Minister of Education to say that in purchasing books for your library from time to time, so far as the Department is concerned you are, of course, under no obligation of any kind whatever to prefer one publishing house or firm to another, and that should any canvasser make representation to you that it would be to your advantage to favor any particular publishing house, you should wholly disregard any such representation.

Toronto, November, 1899.

Apportionment of the Legislative Public School Grant for 1899.

The apportionment of the grant to the several municipalities is based upon the latest returns of population for the year 1898, and the division between the Public and Separate Schools on the average attendance of that year, as reported by the Inspectors, Public School Boards, and Separate School Trustees respectively.

While the Separate Schools will receive their portion of the grant direct from the Department, that of the Public Schools will be paid, according to this schedule, through the respective county, city, town, and village treasurers.

Under the provisions of section 12 of "An Act to improve the Laws respecting Public Schools," passed at the last session of the Legislature, the Education Department is empowered "to appropriate out of moneys voted by the Legislature for Public and Separate Schools, a sum not exceeding $5 00 for every school in which the regulations of the Department as to equipment, ventilation, heating, lighting and the care of the premises generally have been complied with."

Each county inspector is therefore authorized to deduct from the apportionment of each township such an amount as will provide the sum of $5.00 to be paid on his order to each Trustee Board that has complied with the requirements mentioned.

Toronto, May, 1899.

Public School Apportionment to Counties for 1899.

1. COUNTY OF BRANT.

Municipalities.	*Apportionment.*
Brantford	$641 00
Burford	534 00
Dumfries, South	319 00
Oakland	90 00
Onondaga	138 00
Total	$1,722 00

2. COUNTY OF BRUCE.

Albemarle	$168 00
Amabel	407 00
Arran	321 00
Brant	474 00
Bruce	344 00
Carrick	350 00
Culross	250 00
Eastnor	194 00
Elderslie	315 00
Greenock	276 00
Huron	426 00
Kincardine	372 00
Kinloss	307 00
Lindsay and St. Edmunds	88 00
Saugeen	187 00
Total	$4,479 00

3. COUNTY OF CARLETON.

Fitzroy	$315 00
Gloucester	475 00
Goulbourn	308 00
Gower, North	251 00
Huntley	272 00

3. COUNTY OF CARLETON.

Municipalities.	*Apportionment.*
March	$100 00
Marlborough	191 00
Nepean	467 00
Osgoode	529 00
Torbolton	115 00
Total	$3,023 00

4. COUNTY OF DUFFERIN.

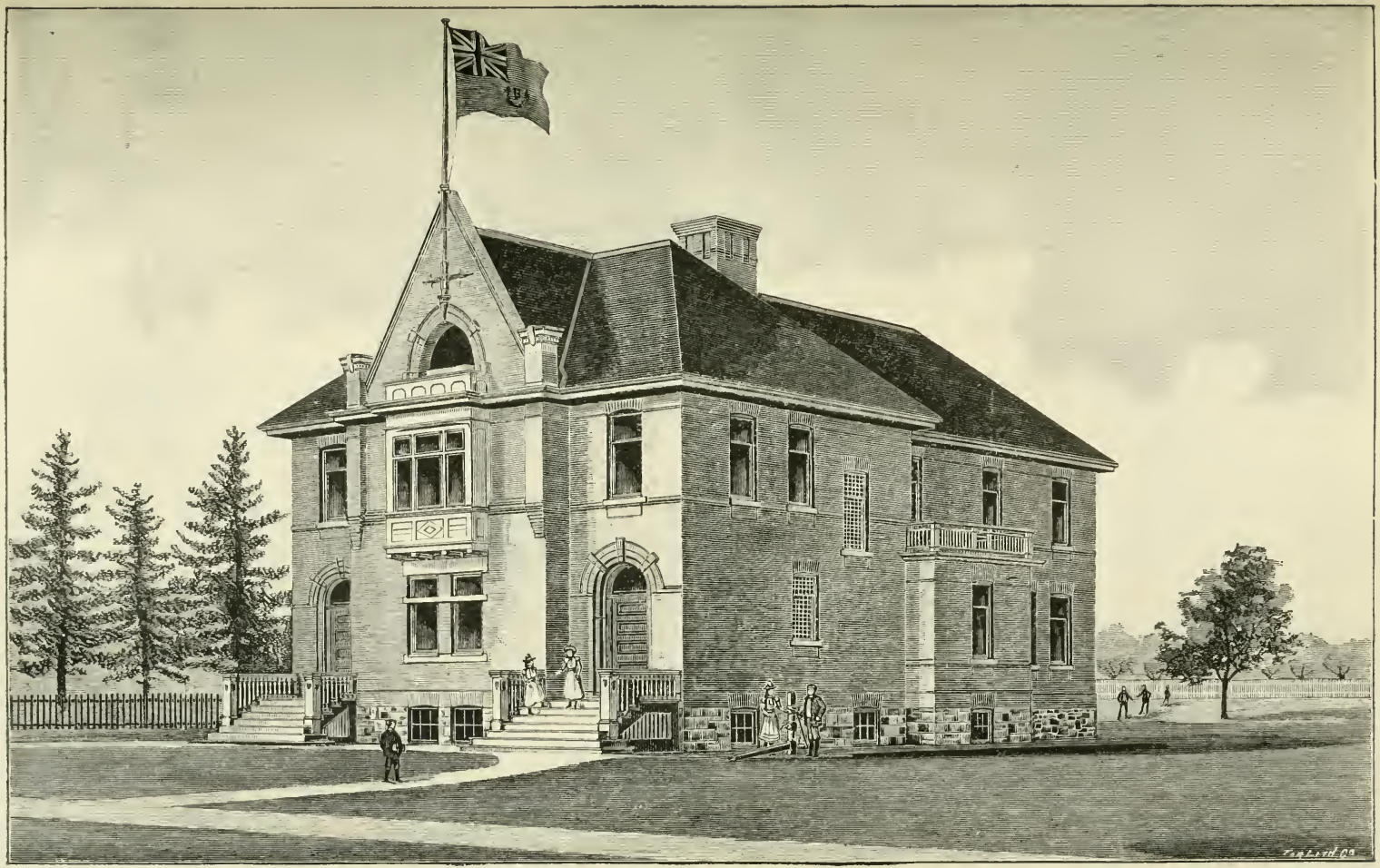
Amaranth	$402 00
Garafraxa, East	271 00
Luther, East	221 00
Melancthon	484 00
Mono	430 00
Mulmur	416 00
Total	$2,224 00

5. COUNTY OF ELGIN.

Aldborough	$595 00
Bayham	419 00
Dorchester, South	185 00
Dunwich	365 00
Malahide	444 00
Southwold	496 00
Yarmouth	596 00
Total	$3,100 00

6. COUNTY OF ESSEX.

Anderdon	$187 00
Colchester, North	155 00
" South	327 00



p. 102] HIGH SCHOOL, RICHMOND HILL.

Public School Apportionment to Counties.

6. COUNTY OF ESSEX.

Municipalities.	*Apportionment.*
Gosfield, North	$215 00
" South	276 00
Maidstone	314 00
Malden	126 00
Mersea	501 00
Pelee Island	76 00
Rochester	292 00
Sandwich, East	206 00
" West	287 00
" South	210 00
Tilbury, North	350 00
" West	280 00
Total	$3,802 00

7. COUNTY OF FRONTENAC.

Barrie	$ 80 00
Bedford	165 00
Clarendon and Miller	99 00
Hinchinbrooke	161 00
Howe Island	
Kennebec	154 00
Kingston	344 00
Loughborough	161 00
Olden	129 00
Oso	132 00
Palmerston and Canonto	122 00
Pittsburg	269 00
Portland	253 00
Storrington	238 00
Wolfe Island	130 00
Total	$2,437 00

8. COUNTY OF GREY.

Artemesia	$423 00
Bentinck	553 00
Collingwood	428 00
Derby	245 00
Egremont	367 00
Euphrasia	389 00
Glenelg	284 00
Holland	407 00
Keppel	418 00
Normanby	482 00
Osprey	405 00
Proton	367 00
Sarawak	147 00
St. Vincent	351 00
Sullivan	432 00
Sydenham	420 00
Total	$6,118 00

9. COUNTY OF HALDIMAND.

Canborough	$122 00
Cayuga, North	198 00

9. COUNTY OF HALDIMAND.

Municipalities.	*Apportionment.*
Cayuga, South	$101 00
Dunn	111 00
Moulton	216 00
Oneida	188 00
Rainham	203 00
Seneca	244 00
Sherbrooke	50 00
Walpole	385 00
Total	$1,818 00

10. COUNTY OF HALIBURTON.

Anson and Hindon	$ 33 00
Cardiff	71 00
Dudley, Dysart, Harcourt, Harburn, Guilford	123 00
Glamorgan	64 00
Livingstone	5 00
Lutterworth	55 00
McClintock	7 00
Minden	150 00
Monmouth	64 00
Nightingale	1 00
Sherbourne	17 00
Snowdon	98 00
Stanhope	50 00
Total	$738 00

11. COUNTY OF HALTON.

Esquesing	$462 00
Nassagaweya	301 00
Nelson	358 00
Trafalgar	446 00
Total	$1,567 00

12. COUNTY OF HASTINGS.

Carlow	$ 70 00
Dungannon	94 00
Elzevir and Grimsthorpe	159 00
Faraday	119 00
Hungerford	401 00
Huntingdon	322 00
McClure, Wicklow and Bangor	103 00
Herschel and Monteagle	220 00
Madoc	328 00
Marmora and Lake	252 00
Mayo	80 00
Rawdon	411 00
Sidney	512 00
Thurlow	577 00
Tudor and Cashel	113 00
Limerick	55 00
Wollaston	88 00
Tyendinaga	376 00
Total	$4,280 00

PUBLIC SCHOOL APPORTIONMENT TO COUNTIES.

13. COUNTY OF HURON.

Municipalities.	*Apportionment.*
Ashfield	$360 00
Colborne	224 00
Goderich	306 00
Grey	435 00
Hay	410 00
Howick	530 00
Hullett	337 00
McKillop	326 00
Morris	367 00
Stanley	272 00
Stephen	453 00
Tuckersmith	320 00
Turnberry	288 00
Usborne	294 00
Wawanosh, East	231 00
" West	240 00
Total	$5,393 00

14. COUNTY OF KENT.

Camden	$308 00
Chatham	676 00
Dover	534 00
Harwich	551 00
Howard	445 00
Orford	328 00
Raleigh	491 00
Romney	214 00
Tilbury, East	361 00
Zone	158 00
Total	$4,066 00

15. COUNTY OF LAMBTON.

Bosanquet	$310 00
Brooke	452 00
Dawn	408 00
Enniskillen	636 00
Euphemia	270 00
Moore	562 00
Plympton	418 00
Sarnia	265 00
Sombra	396 00
Warwick	442 00
Total	$4,159 00

16. COUNTY OF LANARK.

Bathurst	$312 00
Beckwith	206 00
Burgess, North	48 00
Dalhousie and Sherbrooke, North	228 00
Darling	89 00
Drummond	243 00
Elmsley, North	131 00
Lanark	214 00

16. COUNTY OF LANARK.

Municipalities.	*Apportionment.*
Lavant	$ 64 00
Montague	236 00
Pakenham	192 00
Ramsay	265 00
Sherbrooke, South	112 00
Total	$2,340 00

17. COUNTY OF LEEDS.

Bastard and Burgess, South	$343 00
Crosby, North	146 00
" South	206 00
Elizabethtown	482 00
Elmsley, South	95 00
Kitley	230 00
Leeds and Lansdowne, Front	333 00
" " " Rear	270 00
Yonge and Escott, Rear	134 00
Yonge, Front and Escott	298 00
Total	$2,537 00

17 (*a*). COUNTY OF GRENVILLE.

Augusta	$471 00
Edwardsburg	444 00
Gower, South	91 00
Oxford, Rideau	331 00
Wolford	225 00
Total	$1,562 00

18. COUNTY OF LENNOX AND ADDINGTON.

Adolphustown	$ 51 00
Amherst Island	106 00
Anglesea, Effingham and Kaladar	159 00
Camden, East	490 00
Denbigh, Abinger and Ashley	127 00
Ernestown	414 00
Fredericksburg, North	197 00
" South	133 00
Richmond	266 00
Sheffield	220 00
Total	$2,163 00

19. COUNTY OF LINCOLN.

Caistor	$230 00
Clinton	238 00
Gainsborough	279 00
Grantham	222 00
Grimsby, North	137 00
" South	173 00
Louth	202 00
Niagara	215 00
Total	$1,696 00

PUBLIC SCHOOL APPORTIONMENT TO COUNTIES.

20. COUNTY OF MIDDLESEX.

Municipalities.	*Apportionment.*
Adelaide	$263 00
Biddulph	261 00
Caradoc	480 00
Delaware	189 00
Dorchester, North	440 00
Ekfrid	334 00
Lobo	336 00
London	1,084 00
McGillivray	340 00
Metcalfe	189 00
Mosa	338 00
Nissouri, West	320 00
Westminster	584 00
Williams, East	184 00
" West	162 00
Total	$5,504 00

21. COUNTY OF NORFOLK.

Charlotteville	$406 00
Houghton	244 00
Middleton	330 00
Townsend	480 00
Walsingham, North	278 00
" South	238 00
Windham	439 00
Woodhouse	246 00
Total	$2,661 00

22. COUNTY OF NORTHUMBERLAND.

Alnwick	$136 00
Brighton	316 00
Cramahe	315 00
Haldimand	456 00
Hamilton	500 00
Monaghan, south	114 00
Murray	336 00
Percy	375 00
Seymour	371 00
Total	$2,919 00

22 (*a*). COUNTY OF DURHAM.

Cartwright	$227 00
Cavan	316 00
Clarke	518 00
Darlington	527 00
Hope	423 00
Manvers	362 00
Total	$2,373 00

23. COUNTY OF ONTARIO.

Brock	$459 00
Mara	294 00

23. COUNTY OF ONTARIO.

Municipalities.	*Apportionment.*
Pickering	$670 00
Rama	163 00
Reach	457 00
Scott	275 00
Scugog Island	65 00
Thorah	176 00
Uxbridge	337 00
Whitby, East	325 00
Whitby	266 00
Total	$3,487 00

24. COUNTY OF OXFORD.

Blandford	$204 00
Blenheim	591 00
Dereham	431 00
Nissouri, East	330 00
Norwich, North	278 00
" South	325 00
Oxford, North	156 00
" East	247 00
" West	249 00
Zorra, East	496 00
" West	305 00
Total	$3,612 00

25. COUNTY OF PEEL.

Albion	$308 00
Caledon	488 00
Chinguacousy	495 00
Gore of Toronto	110 00
Toronto	617 00
Total	$2,018 00

26. COUNTY OF PERTH.

Blanchard	$337 00
Downie	315 00
Easthope, North	279 00
" South	236 00
Ellice	394 00
Elma	473 00
Fullarton	273 00
Hibbert	250 00
Logan	336 00
Mornington	333 00
Wallace	339 00
Total	$3,565 00

27. COUNTY OF PETERBOROUGH.

Anstruther	$ 30 00
Asphodel	205 00
Belmont	208 00
Burleigh	52 00

PUBLIC SCHOOL APPORTIONMENT TO COUNTIES.

27. COUNTY OF PETERBOROUGH.

Municipalities.	*Apportionment.*
Cavendish	$ 18 00
Chandos	99 00
Douro	251 00
Dummer	248 00
Ennismore	99 00
Galway	111 00
Harvey	122 00
Methuen	29 00
Monaghan, North	136 00
Otonabee	409 00
Smith	340 00
Total	$2,357 00

28. COUNTY OF PRESCOTT.

Alfred	$ 37 00
Caledonia	124 00
Hawkesbury, East	306 00
" West	324 00
Longueuil	65 00
Plantagenet, North	354 00
" South	228 00
Total	$1,438 00

28 (*a*) COUNTY OF RUSSELL.

Cambridge	$184 00
Clarence	169 00
Cumberland	315 00
Russell	202 00
Total	$870 00

29. COUNTY OF PRINCE EDWARD.

Ameliasburg	$366 00
Athol	139 00
Hallowell	352 00
Hillier	199 00
Marysburgh, North	131 00
" South	159 00
Sophiasburg	236 00
Total	$1,582 00

30. COUNTY OF RENFREW.

Admaston	$218 00
Algona, South	107 00
Alice and Fraser	228 00
Bagot and Blithfield	173 00
Brougham	49 00
Bromley	184 00
Brudenell and Lynedoch	166 00
Grattan	228 00
Griffin and Matawatchan	64 00
Hagarty, Jones, Sherwood, Richards and Burns	265 00

30. COUNTY OF RENFREW.

Municipalities.	*Apportionment.*
Head, Clara and Maria	$ 67 00
Horton	188 00
McNab	406 00
Pembroke	80 00
Petewawa	117 00
Radcliffe and Raglan	125 00
Rolph, Wylie, McKay, Buchanan	119 00
Ross	339 00
Sebastopol	86 00
Stafford	97 00
Westmeath	401 00
Wilberforce and Algona, North	271 00
Total	$3,978 00

31. COUNTY OF SIMCOE.

Adjala	$235 00
Essa	495 00
Flos	426 00
Gwillimbury, West	303 00
Innisfil	478 00
Matchedash	53 00
Medonte	477 00
Nottawasaga	659 00
Orillia	588 00
Oro	508 00
Sunnidale	273 00
Tay	476 00
Tiny	370 00
Tecumseth	425 00
Tossorontio	196 00
Vespra	358 00
Total	$6,320 00

32. COUNTY OF STORMONT.

Cornwall	$530 00
Finch	338 00
Osnabruck	599 80
Roxborough	414 00
Total	$1,881 00

32 (*a*). COUNTY OF DUNDAS.

Matilda	$462 00
Mountain	382 00
Williamsburg	465 00
Winchester	401 00
Total	$1,710 00

32 (*b*). COUNTY OF GLENGARRY.

Charlottenburg	$556 00
Kenyon	456 00
Lancaster	401 00
Lochiel	405 00
Total	$1,818 00

Public School Apportionment to Counties.

33. COUNTY OF VICTORIA.

Municipalities.	*Apportionment.*
Bexley	$106 00
Carden	92 00
Dalton	62 00
Eldon	366 00
Emily	244 00
Fenelon	275 00
Laxton, Digby and Longford	95 00
Mariposa	483 00
Ops	287 00
Somerville	256 00
Verulam	231 00
Total	$2,497 00

34. COUNTY OF WATERLOO.

Dumfries, North	$266 00
Waterloo	805 00
Wellesley	491 00
Wilmot	594 00
Woolwich	529 00
Total	$2,685 00

35. COUNTY OF WELLAND.

Bertie	$373 00
Crowland	119 00
Humberstone	337 00
Pelham	291 00
Stamford	241 00
Thorold	241 00
Wainfleet	321 00
Willoughby	119 00
Total	$2,042 00

36. COUNTY OF WELLINGTON.

Arthur	$286 00
Eramosa	324 00
Erin	406 00
Garafraxa, West	326 00
Guelph	280 00
Luther, West	268 00
Maryborough	367 00
Minto	380 00

36. COUNTY OF WELLINGTON.

Municipalities.	*Apportionment.*
Nichol	$200 00
Peel	458 00
Pilkington	180 00
Puslinch	435 00
Total	$3,910 00

37. COUNTY OF WENTWORTH.

Ancaster	$484 00
Barton	427 00
Beverly	505 00
Binbrook	178 00
Flamborough, East	317 00
" West	341 00
Glanford	197 00
Saltfleet	361 00
Total	$2,810 00

38. COUNTY OF YORK.

Etobicoke	$412 00
Georgina	202 00
Gwillimbury, East	416 00
" North	170 00
King	635 00
Markham	636 00
Scarborough	463 00
Vaughan	536 00
Whitchurch	458 00
York	969 00
Total	$4,897 00

39. DISTRICTS.

Municipalities.	*Apportionment.*
Algoma, Muskoka, Nipissing, Parry Sound.. (Including rural separate schools but not schools in towns and villages named in this list.)	$35,000 00
Total	$35 000 00

APPORTIONMENT TO ROMAN CATHOLIC SEPARATE SCHOOLS FOR 1899, PAYABLE THROUGH THIS DEPARTMENT.

School Sections.		*Apportionment.*
Adjala	10	$21 00
Alfred	3	16 00
"	6	26 00
"	7 (with 8, Plantagenet, South)	13 00
"	7	26 00
"	8	33 00
"	9	25 00
Alfred	10	$67 00
"	11	18 00
"	12	34 00
"	13	40 00
"	14	21 00
"	15	22 00
Admaston	4	18 00

APPORTIONMENT TO ROMAN CATHOLIC SEPARATE SCHOOLS FOR 1899.

School Sections.		*Apportionment.*
Anderdon	2, 5 and 8	$31 00
"	3 and 4	16 00
Arthur	6	37 00
"	10	27 00
Ashfield	2	52 00
Asphodel	4	20 00
Augusta	15	25 00
Balfour....1 (District of Algoma)		.....
Biddulph	6	18 00
" ....9 (with 1 McGillivray)		6 00
Bonfield, 5A, 1B, 2 4 (District of Nipissing)		.....
Brant (with 3 Greenock)	2	8 00
Brighton	1 (15)	4 00
Bromley	4	19 00
"	6	22 00
Brougham	1	19 00
Burgess, North	2	31 00
"	4	19 00
"	6	13 00
Caledonia	3, 4 and 10	20 00
" ..6 (with 7 Plantagenet S.)		10 00
"	12	49 00
Cambridge	3	25 00
"	4	26 00
"	5	32 00
"	6 to be app'td.	
"	6 and 7	48 00
Carrick	1	44 00
" (with 1 Culross)	1	70 00
"	2	16 00
" (with 2 Culross)	2	17 00
"	4	17 00
"	14	102 00
Charlottenburg	15	32 00
"	16 to be app'td.	
Clarence	5	80 00
"	6	50 00
"	8	44 00
"	11	31 00
"	12	27 00
"	13	20 00
"	14	33 00
"	16	17 00
"	17 to be app'td.	
"	19	16 00
"	20	21 00
Clarence	21	20 00
Cornwall	1	22 00
"	16	55 00
Crosby, North	4	67 00
"	7	4 00
Culross (with 1 Carrick)	1	71 00
" (with 2 Carrick)	2	17 00

School Sections.		*Apportionment.*
Cumberland	10	$13 00
"	11	15 00
"	13	22 00
"	14	34 00
Downie	9	28 00
Dunnett and Rutter, 1 (District of Algoma.)		
Edwardsburg	2	15 00
Ellice	7	20 00
Ferris....3 (District of Nipissing)		.....
" ....4 " "		.....
Finch	5	38 00
Flamborough, West..	2	14 00
Greenock .....3 (with 2 Brant)		61 00
Glenelg	5	15 00
"	7	32 00
Gloucester .....1 (with 3 Osgoode)		9 00
"	4, 5 and 12	8 00
"	14	28 00
"	15	59 00
"	17	8 00
"	20	28 00
"	22	16 00
"	25	87 00
"	26	26 00
Griffith, etc	3	10 00
Hagarty	4	22 00
Haldimand	2	21 00
"	14	12 00
"	21	8 00
Harwich	9	31 00
Hawkesbury, East..	2	56 00
" ..	4	11 00
" ..	6	19 00
" ..	7	92 00
" ..	10	51 00
" ..	11	22 00
" ..	12	17 00
" ..	15	22 00
" ..	16	7 00
Hay	1	50 00
Hibbert	1 (3)	17 00
Howe Island	1	24 00
"	2	45 00
"	3	33 00
Holland, etc	3	18 00
Hullet	2	10 00
Keewatin..1 (see District of Algoma)		.....
Kingston	8	20 00
Lancaster	14	37 00
Lochiel	12A	25 00
"	12B	70 00
Longueuil, West...	2	20 00
"	4A	19 00
"	7	19 00

APPORTIONMENT TO ROMAN CATHOLIC SEPARATE SCHOOLS FOR 1899.

School Sections.	*Apportionment.*	
Loughboro'	2	$17 00
"	10	20 00
Maidstone	1	44 00
"	4 (with 2 Rochester)	12 00
Malden	3A	28 00
"	3B	24 00
Mara	3	69 00
March	3	37 00
Marmora and Lake	1	10 00
Matawatchan	3	15 00
Moore	3, 4 and 5	12 00
Mornington	4	37 00
McGillivray	1 (with 9 Biddulph)	8 00
McKillop	1	20 00
Nepean	7	39 00
"	15	64 00
Nichol	1	23 00
Normanby	5	24 00
"	10	13 00
Osgoode	1	20 00
"	2 (15)	11 00
"	3 (with 1 Gloucester)	12 00
Papineau	1 (see District of Nipissing)	
"	2 " "	
"	2B " "	
Peel	8	2 00
"	12	17 00
Percy	5	8 00
"	12 (with 12 Seymour)	7 00
Plantagenet, North	4	21 00
" "	7	19 00
" "	8	24 00
" "	9	24 00
" "	12	19 00
" South	4	37 00
" "	7	30 00
" "	7 (with 6 Caledonia)	9 00
" "	8	27 00
" "	8 (with 7 Alfred)	11 00
Proton	6	21 00
Raleigh	4	13 00
"	5	27 00
"	6	28 00
Rayside	1 (District of Algoma)	
Richmond	10 and 17	13 00
Rochester	2 (with 4 Maidstone)	22 00
Roxboro'	12	$55 00
"	16	33 00
Russell	1	9 00
"	4	13 00
"	6	62 00
"	7	23 00
"	8	36 00
Sandwich East	1	92 00
"	2	32 00
Sandwich, West	6 and 9	26 00
Seymour	12 (with 12 Percy)	9 00
Sheffield	5	28 00
Sombra	5	33 00
Stafford	2	24 00
Stephen	6	38 00
Springer	1 (District of Nipissing)	
"	2 " "	
Sydenham	7	10 00
Tiny	2	110 00
Toronto Gore	6	14 00
Tyendinaga	18	16 00
"	20	20 00
"	24	19 00
"	28	12 00
"	30	9 00
Vespra	7	7 00
Waterloo	13	63 00
Wawanosh, West	1	23 00
Wellesley	5	15 00
"	9 and 10	27 00
"	11	71 00
"	12	9 00
Westminster	13	12 00
Widdifield	2 (District of Nipissing)	
Williams, West	10	17 00
Wilmot	15½	56 00
Winchester	12 (with 1 Russell)	10 00
Windham	8	49 00
Wolfe Island	1	6 00
"	2	17 00
"	4	27 00
Woolwich	10	24 00
Yonge and Escott R.	4	12 00
York	1	33 00
		$5,373 00

APPORTIONMENT TO CITIES, TOWNS AND VILLAGES FOR 1899.

Cities.	Public Schools.	Separate Schools.	Total.
	$ c.	$ c.	$ c.
Belleville	990 00	262 00	1,252 00
Brantford	1,966 00	248 00	2,214 00
Chatham	933 00	165 00	1,098 00
Guelph	1,055 00	260 00	1,315 00
Hamilton	5,258 00	879 00	6,155 00
Kingston	1,751 00	490 00	2,241 00
London	3,912 00	544 00	4,456 00
Ottawa	3,314 00	3,500 00	6,814 00
St. Catharines	1,030 00	235 00	1,265 00
St. Thomas	1,217 00	138 00	1,355 00
Stratford	1,067 00	238 00	1,295 00
Toronto	20,067 00	2,875 00	22,942 00
Windsor	1,390 00	.....	1,390 00
Total	43,940 00	9,852 00	53,792 00
Towns			
Alliston	222 00	.....	222 00
Almonte	277 00	105 00	382 00
Amherstburg	119 00	136 00	255 00
Arnprior	278 00	178 00	456 00
Aurora	188 00	.....	188 00
Aylmer	267 00	.....	267 00
Barrie	572 00	107 00	679 00
Berlin	914 00	229 00	1,143 00
Blenheim	215 00	.....	215 00
Bothwell	118 00	.....	118 00
Bowmanville	405 00	.....	405 00
Bracebridge	246 00	.....	246 00
Brampton	346 00	.....	346 00
Brockville	829 00	258 00	1,087 00
Carleton Place	516 00	.....	516 00
Clinton	317 00	.....	317 00
Cobourg	379 00	138 00	517 00
Collingwood	680 00	.....	680 00
Cornwall	333 00	446 00	779 00
Deseronto	399 00	.....	399 00
Dresden	219 00	.....	219 00
Dundas	359 00	133 00	492 00
Durham	154 00	.....	154 00
Essex	175 00	.....	175 00
Forest	192 00	.....	192 00
Fort William	195 00	.....	195 00
Galt	857 00	55 00	912 00
Gananoque	438 00	.....	438 00
Goderich	412 00	51 00	463 00
Gore Bay	68 00	.....	68 00
Gravenhurst	228 00	.....	228 00
Harriston	219 00	.....	219 00
Ingersoll	484 00	77 00	561 00
Kincardine	287 00	.....	287 00
Leamington	334 00	.....	334 00
Lindsay	653 00	226 00	879 00
Listowel	310 00	.....	310 00
Little Current	117 00	.....	117 00
Mattawa	66 00	144 00	210 00
Meaford	229 00	.....	229 00
Midland	295 00	.....	295 00

APPORTIONMENT TO CITIES, TOWNS AND VILLAGES FOR 1899.

Towns.	Public Schools.	Separate Schools.	Total.
	$ c.	$ c.	$ c.
Mitchell	262 00	.....	262 00
Milton	150 00	.....	150 00
Mount Forest	294 00	.....	294 00
Napanee	385 00	.....	385 00
Newmarket	224 00	37 00	261 00
Niagara	147 00	.....	147 00
Niagara Falls	412 00	107 00	519 00
North Bay	160 00	89 00	249 00
North Toronto	198 00	.....	198 00
Oakville	181 00	18 00	199 00
Orangeville	439 00	.....	439 00
Orillia	484 00	105 00	589 00
Oshawa	458 00	51 00	509 00
Owen Sound	927 00	70 00	997 00
Palmerston	234 00	.....	234 00
Parkhill	156 00	36 00	192 00
Paris	340 00	34 00	374 00
Parry Sound	168 00	.....	168 00
Pembroke	352 00	266 00	618 00
Penetanguishene	299 00	.....	299 00
Perth	329 00	124 00	453 00
Peterborough	933 00	403 00	1,336 00
Petrolea	563 00	.....	563 00
Picton	402 00	27 00	429 00
Port Arthur	271 00	99 00	370 00
Port Hope	560 00	.....	560 00
Prescott	274 00	148 00	422 00
Rat Portage	212 00	67 00	279 00
Renfrew	226 00	153 00	379 00
Ridgetown	272 00	.....	272 00
Sandwich	173 00	.....	173 00
Sarnia	760 00	101 00	861 00
Sault Ste. Marie	350 00	62 00	412 00
Seaforth	296 00	.....	296 00
Simcoe	347 00	.....	347 00
Smith's Falls	543 00	.....	543 00
Stayner	145 00	.....	145 00
Sturgeon Falls	44 00	91 00	135 00
St. Mary's	371 00	48 00	419 00
Strathroy	377 00	.....	377 00
Sudbury	100 00	88 00	188 00
Thessalon	61 00	.....	61 00
Thornbury	75 00	.....	75 00
Thorold	180 00	74 00	254 00
Tilsonburg	277 00	.....	277 00
Toronto Junction	659 00	.....	659 00
Trenton	347 00	160 00	507 00
Uxbridge	219 00	.....	219 00
Vankleekhill	145 00	138 00	283 00
Walkerton	269 00	94 00	363 00
Walkerville	142 00	.....	142 00
Wallaceburg	298 00	58 00	356 00
Waterloo	358 00	71 00	429 00
Welland	227 00	.....	227 00
Whitby	263 00	34 00	297 00
Wiarton	258 00	.....	258 00
Wingham	261 00	.....	261 00
Woodstock	1,107 00	.....	1,107 00
Totals	32,875 00	5,136 00	38,011 00

APPORTIONMENT TO CITIES, TOWNS AND VILLAGES, FOR 1899.

Incorporated Villages.	Public Schools.	Separate Schools.	Total.
	$ c.	$ c.	$ c.
Acton	172 00	.....	172 00
Ailsa Craig	94 00	.....	94 00
Alexandria	46 00	163 00	209 00
Alvinston	124 00	.....	124 00
Arkona	61 00	.....	61 00
Arthur	125 00	71 00	196 00
Athens	119 00	.....	119 00
Ayr	112 00	.....	112 00
Ashburnham	209 00	.....	209 00
Bath	52 00	.....	52 00
Bayfield	82 00	.....	82 00
Beamsville	99 00	.....	99 00
Beaverton	96 00	.....	96 00
Beeton	92 00	.....	92 00
Belle River	69 00	.....	69 00
Blyth	115 00	.....	115 00
Bobcaygeon	103 00	.....	103 00
Bolton	79 00	.....	79 00
Bradford	120 00	.....	120 00
Bridgeburg	152 00	.....	152 00
Brighton	171 00	.....	171 00
Brussels	145 00	.....	145 00
Burk's Falls	81 00	.....	81 00
Burlington	162 00	.....	162 00
Caledonia	116 00	.....	116 00
Campbellford	289 00	.....	289 00
Cannington	143 00	.....	143 00
Cardinal	111 00	.....	111 00
Casselman	29 00	87 00	116 00
Cayuga	137 00	.....	137 00
Chesley	210 00	.....	210 00
Chesterville	94 00	.....	94 00
Chippewa	62 00	.....	62 00
Clifford	79 00	.....	79 00
Colborne	134 00	.....	134 00
Creemore	76 00	.....	76 00
Delhi	103 00	.....	103 00
Drayton	109 00	.....	109 00
Dundalk	90 00	.....	90 00
Dunnville	234 00	.....	234 00
Dutton	93 00	.....	93 00
East Toronto	168 00	.....	168 00
Eganville	59 00	61 00	120 00
Elmira	134 00	.....	134 00
Elora	140 00	19 00	159 00
Embro	77 00	.....	77 00
Erin	62 00	.....	62 00
Exeter	220 00	.....	220 00
Fenelon Falls	162 00	.....	162 00
Fergus	184 00	14 00	198 00
Fort Erie	111 00	.....	111 00
Garden Island	38 00	.....	38 00
Georgetown	179 00	.....	179 00
Glencoe	125 00	.....	125 00
Grand Valley	91 00	.....	91 00
Grimsby	105 00	.....	105 00

APPORTIONMENT TO CITIES, TOWNS AND VILLAGES FOR 1899.

Incorporated Villages.	Public Schools.	Separate Schools.	Total.
	$ c.	$ c.	$ c.
Hagarsville	119 00	.....	119 00
Hastings	58 00	41 00	99 00
Havelock	110 00	.....	110 00
Hawkesbury	47 00	215 00	262 00
Hensall	111 00	.....	111 00
Hespeler	273 00	.....	273 00
Hintonburg	144 00	123 00	267 00
Holland Landing	50 00	.....	50 00
Huntsville	153 00	.....	153 00
Iroquois	144 00	.....	144 00
Kemptville	164 00	.....	164 00
Kingsville	147 00	.....	147 00
Lakefield	143 00	.....	143 00
Lanark	105 00	.....	105 00
Lancaster	65 00	.....	65 00
L'Orignal	122 00	26 00	148 00
London, West	241 00	.....	241 00
Lucan	99 00	.....	99 00
Lucknow	182 00	.....	182 00
Madoc	148 00	.....	148 00
Markdale	99 00	.....	99 00
Markham	127 00	.....	127 00
Maxville	86 00	.....	86 00
Merrickville	124 00	.....	124 00
Merritton	164 00	44 00	208 00
Millbrook	116 00	.....	116 00
Milverton	75 00	.....	75 00
Morrisburg	219 00	.....	219 00
Newboro'	54 00	.....	54 00
Newburg	78 00	.....	78 00
Newbury	50 00	.....	50 00
Newcastle	72 00	.....	72 00
New Hamburg	152 00	.....	152 00
Niagara Falls, South	165 00	.....	165 00
Norwich	160 00	.....	160 00
Norwood	135 00	.....	135 00
Oil Springs	124 00	.....	124 00
Omemee	68 00	.....	68 00
Ottawa, East	117 00	.....	117 00
Paisley	135 00	.....	135 00
Point Edward	166 00	.....	166 00
Portsmouth	48 00	38 00	86 00
Port Carling	33 00	.....	33 00
Port Colborne	121 00	21 00	142 00
Port Dalhousie	90 00	25 00	115 00
Port Dover	142 00	.....	142 00
Port Elgin	173 00	.....	173 00
Port Perry	184 00	.....	184 00
Port Rowan	74 00	.....	74 00
Port Stanley	74 00	.....	74 00
Preston	208 00	51 00	259 00
Richmond	44 00	.....	44 00
Richmond Hill	80 00	.....	80 00
Rockland	23 00	137 00	160 00
Shelburne	162 00	.....	162 00
Southampton	191 00	.....	191 00

APPORTIONMENT TO CITIES, TOWNS AND VILLAGES FOR 1899.

Incorporated Villages.	Public Schools.	Separate Schools.	Total.
	$ c	$ c.	$ c.
Springfield	56 00	.....	56 00
Stirling	102 00	.....	102 00
Stouffville	154 00	.....	154 00
Streetsville	75 00	.....	75 00
Sundridge	44 00	.....	40 00
Sutton	77 00	.....	77 00
Tara	80 00	.....	80 00
Teeswater	126 00	.....	126 00
Thamesville	106 00	.....	106 00
Thedford	73 00	.....	73 00
Tilbury	62 00	65 00	127 00
Tiverton	62 00	.....	62 00
Tottenham	86 00	.....	86 00
Tweed	96 00	27 00	123 00
Vienna	45 00	.....	45 00
Wardsville	41 00	.....	41 00
Waterdown	96 00	.....	96 00
Waterford	129 00	.....	129 00
Watford	168 00	.....	168 00
Wellington	76 00	.....	76 00
Weston	113 00	20 00	133 00
Winchester	124 00	.....	124 00
Woodbridge	82 00	.....	82 00
Woodville	67 00	.....	67 00
Wyoming	105 00	.....	105 00
Wroxeter	56 00	.....	56 00
Total	15,703 00	1,248 00	16,951 00

SUMMARY OF APPORTIONMENT FOR 1899.

Counties.	Public Schools.	Separate Schools.	Total.
	$ c.	$ c.	$ c.
1. Brant	1,722 00		1,722 00
2. Bruce	4,479 00	423 00	4,902 00
3. Carleton	3,023 00	452 00	3,475 00
4. Dufferin	2,224 00		2,224 00
5. Elgin	3,100 00		3,100 00
6. Essex	3,802 00	327 00	4,129 00
7. Frontenac	2,437 00	209 00	2,646 00
8. Grey	6,118 00	133 00	6,251 00
9. Haldimand	1,818 00		1,818 00
10. Haliburton	738 00		738 00
11. Halton	1,567 00		1,567 00
12. Hastings	4,280 00	86 00	4,366 00
13. Huron	5,393 00	193 00	5,586 00
14. Kent	4,066 00	99 00	4,165 00
15. Lambton	4,159 00	45 00	4,204 00
16. Lanark	2,340 00	63 00	2,403 00
17. Leeds and Grenville	4,099 00	123 00	4,222 00
18. Lennox and Addington	2,163 00	41 00	2,204 00
19. Lincoln	1,696 00		1,696 00
20. Middlesex	5,504 00	61 00	5,565 00
21. Norfolk	2,661 00	49 00	2,710 00
22. Northumberland	5,292 00	69 00	5,361 00
23. Ontario	3,487 00	69 00	3,556 00
24. Oxford	3,612 00		3,612 00
25. Peel	2,018 00	14 00	2,032 00
26. Perth	3,565 00	102 00	3,667 00
27. Peterborough	2,357 00	20 00	2,377 00
28. Prescott and Russell	2,308 00	1,713 00	4,021 00
29. Prince Edward	1,582 00		1,582 00
30. Renfrew	3,978 00	149 00	4,127 00
31. Simcoe	6,320 00	138 00	6,458 00
32. Stormont, Dundas and Glengarry	5,409 00	377 00	5,786 00
33. Victoria	2,497 00		2,497 00
34. Waterloo	2,685 00	265 00	2,950 00
35. Welland	2,042 00		2,042 00
36. Wellington	3,910 00	106 00	4,016 00
37. Wentworth	2,810 00	14 00	2,824 00
38. York	4,897 00	33 00	4,930 00
Total	126,158 00	5,373 00	131,531 00
39. Districts— (*a*) Algoma, (*b*) Muskoka, (*c*) Nipissing, (*d*) Parry Sound. Exclusive of the towns and villages which appear in the general list.	33,900 00	1,100 00	35,000 00
Total	33,900 00	1,100 00	35,000 00
Grand totals			
Counties	126,158 00	5,373 00	131,531 00
Cities	43,940 00	9,852 00	53,792 00
Towns	32,875 00	5,136 00	38,011 00
Villages	15,703 00	1,248 00	16,951 00
Districts	33,900 00	1,100 00	35,000 00
Totals	252,576 00	22,709 00	$275,285 00

APPENDIX C.—*ONTARIO NORMAL COLLEGE, PROVINCIAL, NORMAL AND MODEL SCHOOLS.*

I. *ONTARIO NORMAL SCHOOL.*

1. *Staff of Ontario Normal College. 1899.*

J. A. McLellan, M.A., LL.D., Professor of Psychology and History of Education, Principal.
R. A. Thompson, B A , Lecturer on School Management, Vice-Principal.
J. T. Crawford, B A., Lecturer on Methods in Mathematics.
W. M. Logan, M.A., Lecturer on Methods in Classics.
F. F. Macpherson, B.A., Lecturer on Methods in Literature and Composition.
S. A. Morgan, B.A., B. Paed., Lecturer on Methods in English Grammar and Rhetoric.
A. Paterson, M.A., Lecturer on Methods in History and Geography.
E. S. Hogarth, B.A., Lecturer on Methods in Modern Languages.
J. B. Turner, B.A., Lecturer on Methods in Chemistry, Botany and Zoology.
J. Gill, B.A.. Lecturer on Methods in Physics.
F. F. Macpherson, B.A., Lecturer on Reading and Elocution.
J. B. Turner, B.A , Lecturer on School Hygiene and Sanitation.

2. *Students in Ontario Normal College, 1899.*

	Admitted.	
	Male.	Female.
Session 1899	57	91

II. *PROVINCIAL, NORMAL AND MODEL SCHOOLS.*

1. Toronto Normal School.

1. *Staff of Toronto Normal School, 1899.*

Wm. Scott, B.A. ..... Principal.
W. H. Elliott, B.A. ..... Vice-Principal.
A. C. Casselman ..... Drawing Master, and in Model School.
S. H. Preston ..... Music " "
Eugene Mason ..... French Teacher.

2. *Students in Toronto Normal School, 1899.*

	Admitted.	
	Male.	Female.
First Session	13	118
Second Session	25	107
Total	38	225

P. 116] DUHAMEL ROMAN CATHOLIC SEPARATE SCHOOL, OTTAWA.

2. Ottawa Normal School.

1. *Staff of Ottawa Normal School, 1899.*

John A. MacCabe, M.A., LL.D. ..... Principal.
S. B. Sinclair, B.A. ..... Vice-Principal.
A. F. Newlands ..... Drawing Master, and in Model School.
T. A. Brown ..... Music " "
J. Fleury ..... French Teacher.

2. *Students in Ottawa Normal School, 1899.*

	Admitted.	
	Male.	Female.
First Session	30	82
Second Session	25	78
Total	55	160

3. Toronto Model School.

1. *Staff of Toronto Model School, 1899.*

Angus McIntosh ..... Head Master Boys' Model School.
R. W. Murray ..... First Assistant "
Thomas M. Porter ..... Second " "
Miss Jeannie Wood ..... Third " "
" H. B. Mills, B.A. ..... Fourth " "
" Margaret T. Scott ..... Head Mistress, Girls' Model School
" Mary K. Caulfeild ..... First Assistant "
" M. Meehan ..... Second " "
" Alice Stuart ..... Third " "
" Sarah M. Ross ..... Fourth " "
" Mary E. Macintyre ..... Kindergarten Teacher.
" Ellen Cody ..... " Assistant.
" W. Mackenzie ..... Instructor in Calisthenics.
Mrs. L. H. Baldwin ..... " Domestic Science.

2. *Number of Pupils in 1899.*

Boys, 254 ..... Girls, 248 ..... Total, 502
Kindergarten ..... Total, 53

4. Ottawa Model School.

1. *Staff of Ottawa Model School, 1899.*

Edwin D. Parlow ..... Head Master, Boys' Model School.
J. H. Putman ..... First Assistant "
J. F. Sullivan ..... Second " "
Miss H. S Williams ..... Third " "
" Adeline Shenick ..... Head Mistress, Girls' Model School.
" A. E. G. Wilson ..... First Assistant "
" M. E. Butterworth ..... Second " "
" Florence Hanington ..... Third " "
" Eliza Bolton ..... Kindergarten Teacher.
" J. Alexander ..... " Assistant.
" Elizabeth Keyes ..... Teacher of Physical Culture.

2. *Number of Pupils, 1899.*

Boys, 148 ..... Girls, 103 ..... Total, 251
Kindergarten ..... Total, 57

APPENDIX D.—*INSPECTION OF SCHOOLS, 1898.*

I. Public Schools.

I. *List of Inspectors.*

Name.	Jurisdiction.	Post Office.	*Salary, 1898.
			$ c.
M. J. Kelly, M.D., LL.B.	Brant; City of Brantford, Town of Paris	Brantford	1,078 00
W. S. Clendening	Bruce East; Towns of Walkerton, Wiarton, Villages of Chesley, Tara	Walkerton	1,356 25
Alexander Campbell	Bruce, West; Town of Kincardine, Villages of Lucknow, Paisley, Port Elgin, Southampton, Teeswater, Tiverton	Kincardine	1,388 75
Robert H. Cowley	Carleton; Villages of Hintonburg, Ottawa East, Richmond	Ottawa	1,636 25
Nathaniel Gordon	Dufferin; Town of Orangeville, Villages of Grand Valley, Shelburne	Orangeville	1,080 00
Arthur Brown	Dundas; Villages of Chesterville, Iroquois, Morrisburg, Winchester	Morrisburg	1,050 00
W. E. Tilley, M.A., Ph.D	Durham: Towns of Bowmanville, Port Hope, Villages of Millbrook, Newcastle	Bowmanville	1,545 00
Welbern Atkin	Elgin; Town of Aylmer, Villages of Dutton, Port Stanley, Springfield, Vienna	St. Thomas	1,540 00
Theo. Girardot	Essex, North (No. 1), Town of Sandwich, Village of Belle River	Sandwich	1,000 00
D. A. Maxwell, B.A. LL.B., Ph.D	Essex, South (No. 2); City of Windsor, Towns of Amherstburg, Essex, Leamington, Walkerville, Village of Kingsville	Windsor	1,099 50
Wm. Spankie, M.D.	Frontenac; Villages of Garden Island, Portsmouth	Kingston	1,507 50
Don'ld McDiarmid, M.D	Glengarry; Villages of Alexandria, Lancaster, Maxville	Maxville	840 00
Andrew Grier	Grey, East; Town of Thornbury	Thornbury	955 00
Thomas Gordon	Grey, West; Town of Owen Sound	Owen Sound	1,238 75
N. W. Campbell	Grey, South; Towns of Durham, Meaford, Villages of Dundalk; Markdale	Durham	1,263 25
Clarke Moses	Haldimand; Villages of Caledonia, Cayuga, Dunnville, Hagarsville	Caledonia	1,190 00
Sylvanus Phillips, B.A.	Haliburton and North East Muskoka, South Nipissing, East Parry Sound; Village of Huntsville	Minden	1,164 75
J. S. Deacon	Halton; Towns of Milton, Oakville, Villages of Acton, Burlington, Georgetown	Milton	1,386 25
William MacKintosh	Hastings, North; Villages of Madoc, Stirling	Madoc	1,492 50
John Johnston	Hastings, South: City of Belleville, Towns of Deseronto, Trenton, Villages of Tweed, Wallbridge	Belleville	1,571 00
David Robb	Huron, East (N.); Towns of Clinton, Seaforth, Wingham, Villages of Blyth, Brussels, Wroxeter	Brussels	1,397 50
J. E. Tom	Huron, West (S); Town of Goderich, Villages of Bayfield, Exeter, Hensall	Goderich	1,483 50
Rev. W. H. G. Colles	Kent, East; Towns of Bothwell, Ridgetown, Village of Thamesville	Chatham	1,040 00
Robert Park	Kent, West; Towns of Blenheim, Dresden, Wallaceburg, Village of Tilbury	Chatham	1,130 00
C. A. Barnes, M.A	Lambton, East (No. 1); Villages of Alvinston, Arkona, Thedford, Watford, Wyoming	London	1,254 00
John Brebner	Lambton, West (No. 2); Towns of Petrolea, Sarnia, Villages of Oil Springs, Point Edward	Sarnia	1,359 00
F. L. Michell, M.A	Lanark; Towns of Almonte, Carleton Place, Perth, Smith's Falls, Village of Lanark	Perth	1,850 00
Wm. Johnston, M.A., LL.B	Leeds and Grenville, No. 1; Town of Gananoque, Village of Newboro	Athens	1,150 00
Robert Kinney, M.D	Leeds and Grenville, No. 2; Village of Athens	Brockville	1,050 00

* In some instances travelling expenses are included.

List of Inspectors.

Name.	Jurisdiction.	Post Office.	Salary, 1898.
			$ c.
T. A. Craig	Leeds and Grenville, No. 3; Town of Prescott, Villages of Cardinal, Kemptville, Merrickville	Kemptville	1,020 00
Frederick Burrows	Lennox and Addington; Town of Napanee, Villages of Bath, Newburgh	Napanee	1,380 00
J. B. Grey	Lincoln; City of St. Catharines, Town of Niagara, Villages of Beamsville, Grimsby, Merritton, Port Dalhousie	St. Catharines	1,235 09
John Dearness	Middlesex, East; Villages of London West, Lucan	London	1,300 00
H. D. Johnson	Middlesex, West; Towns of Parkhill, Strathroy, Villages of Ailsa Craig, Glencoe, Newbury, Wardsville	Strathroy	1,230 00
J. J. Wadsworth, M.A., M.B	Norfolk; Town of Simcoe, Villages of Delhi, Port Dover, Port Rowan, Waterford	Simcoe	1,490 00
Albert Odell	Northumberland; Town of Cobourg, Villages of Brighton, Campbellford, Colborne, Hastings	Cobourg	1,580 00
James McBrien	Ontario; Towns of Oshawa, Uxbridge, Whitby, Villages of Beaverton, Cannington, Port Perry	Prince Albert	1,620 00
William Carlyle	Oxford; Towns of Ingersoll, Tilsonburg, Woodstock, Villages of Embro, Norwich	Woodstock	1,735 00
Allan Embury	Peel; Town of Brampton, Village of Bolton, Streetsville	Brampton	1,200 00
William Irwin, B.A	Perth; Towns of Listowel, Mitchell, St. Mary's Village of Milverton	Stratford	1,595 00
J. C. Brown	Peterborough; Villages of Apsley, Ashburnham, Havelock, Lakefield, Norwood	Peterborough	1,323 50
W. J. Summerby	Prescott and Russell; Town of Vankleekhill, Villages of Casselman, Hawkesbury, L'Orignal, Rockland	Russell	1,535 00
G. D. Platt, B.A	Prince Edward; Town of Picton, Village of Wellington	Picton	945 00
R. G. Scott, B.A	Renfrew; Towns of Arnprior, Pembroke, Renfrew, Village of Eganville	Pembroke	2,083 75
J. C. Morgan, M.A	Simcoe, North; Towns of Barrie, Midland, Orillia, Penetanguishene	Barrie	1,300 00
Rev. Thomas McKee	Simcoe, South West; Towns of Alliston, Stayner, Villages of Allandale, Beeton, Bradford, Creemore, Tottenham	Barrie	1,325 00
Isaac Day, B.A	Simcoe, East, and West Muskoka; Town of Gravenhurst, Village of Port Carling	Orillia	1,230 00
Alexander McNaughton	Stormont; Town of Cornwall	Cornwall	990 00
J. H. Knight	Victoria, East; Town of Lindsay, Villages of Bobcaygeon, Omemee	Lindsay	778 25
Henry Reazin	Victoria, West, and South-East Muskoka; Town of Bracebridge, Villages of Fenelon Falls, Woodville	Lindsay	1,247 50
Thomas Pearce	Waterloo; Towns of Berlin, Galt, Villages of Ayr, Elmira, Hespeler, New Hamburg, Preston	Berlin	2,160 00
J. H. Ball, M.A	Welland; Town of Thorold, Villages of Bridgeburg, Chippewa, Fort Erie, Niagara Falls South, Port Colborne	Welland	1,210 00
David Clapp, B.A	Wellington, North; Towns of Harriston, Mount Forest, Palmerston, Villages of Arthur, Clifford, Drayton	Harriston	1,100 00
J. J. Craig, B.A	Wellington, South; Villages of Elora, Erin, Fergus	Fergus	1,100 00
J. H. Smith	Wentworth; Town of Dundas, Village of Waterdown	Hamilton	1,260 00
A. B. Davidson, B.A	York, North; Towns of Aurora, Newmarket, Villages of Holland Landing, Richmond Hill, Sutton	Newmarket	1,075 00
David Fotheringham	York, South; Towns of North Toronto, Toronto Junction, Villages of East Toronto, Markham, Stouffville, Weston, Woodbridge	Toronto	1,2

List of Inspectors.

Name.	Jurisdiction.	Post Office.	Salary, 1898.
			$ c.
Donald McCaig	Districts of Algoma, Thunder Bay, Rainy River, Towns of Fort William, Gore Bay, Little Current, Port Arthur, Rat Portage, Sault Ste. Marie, Thessalon, Villages of Day Mills, Keewatin	Collingwood.. .	1,929 72
Rev. Geo. Grant, B.A...	Districts of North Nipissing and West Parry Sound; Towns of Mattawa, North Bay, Parry Sound, Sturgeon Falls, Sudbury, Villages of Burk's Falls, Sundridge	Orillia	1,530 00
Rev. A. McColl, D.D...	City of	Chatham	400 00
Wm. Tytler, B.A.	"	Guelph	500 00
W. H. Ballard, M.A....	"	Hamilton	2,000 00
W. G. Kidd	"	Kingston	1,400 00
W. J. Carson	"	London	1,560 00
John C. Clashan.....	"	Ottawa	2,000 00
John McLean	"	St. Thomas	357 00
J. R. Stuart	"	Stratford	1,000 00
James L. Hughes	"	Toronto	3,000 00
W. F. Chapman	"	"	2,000 00
Robert Meade, M.A....	Town of	Brockville.....	900 00
Donald McCaig	"	Collingwood....	175 00
C. W. Chadwick.....	" Forest	Toronto	50 00
Duncan Walker, B.A. ..	"	Peterborough ..	1,100 00
Thomas Hilliard.....	"	Waterloo	80 00
The Hon. Richard Harcourt, M.A., Q.C....	Niagara Falls, Wellan d	Toronto	160 00
			94,574 47

Separate School Inspectors.

James F. White	$2,380 20
Wm. Prendergast, B.A.	2,227 25

County Model School Inspector.

John J. Tilley	$2,050 00

High School Inspectors.

John E. Hodgson, M.A.....	$2,934 35
John Seath, B. A	2,900 00
Total salaries	$107,066 27

II. *Diplomas for Rural School Premises, 1899*

Name of Inspector.	Jurisdiction.	No. schools open.	No. diplomas.	Name of inspector.	Jurisdiction.	No. Schools open.	No. diplomas.
A. Campbell	W. Bruce	88	3	J. McBrien	Ontario	119	8
A. Brown	Dundas	80	12	W. Carlyle	Oxford	108	2
W. Spankie	Frontenac	141	6	Isaac Day	E. Simcoe, W. Muskoka	76	9
N. W. Campbell	S. Grey	90	7				
S. Phillips	E. Parry Sd	....	1	J. H. Knight	E. Victoria	46	1
J. S. Deacon	Halton	61	7	T. Pearce	Waterloo	86	4
D. Robb	E. Huron	85	8	J. J. Craig	S. Wellington	67	13
R. Park	W. Kent	73	9	J. H. Smith	Wentworth	74	4
C. A. Barnes	No. 1, Lambton.	100	3	D. Fotheringham	S. York	71	3
W. Johnston	No. 1, Leeds	79	6	G. Grant	Nipissing	38	} 3
R. Kenney	No. 2, Leeds	84	12	G. Grant	Parry Sound	105	}
J. B. Grey	Lincoln	70	15	G. Grant	W. Parry Sound & N. Nipissing	....	10
J. Dearness	E. Middlesex	101	23				
H. D. Johnson	W. Middlesex	83	3	Hon. R. Harcourt	Niagara Falls	1	1

APPENDIX E.—*SUPERANNUATED TEACHERS, 1899.*

(*Continued from Report of 1898*).

(1) Allowances Granted during 1899.

Register No.	Name.	Age.	Post Office.	Years of Service.	Allowance.
					$ c.
1028	Adair, Chas. F	48	Cataraqui	27	162 00
1029	Middleton, Geo	60	Lucknow	24	156 50
1030	Keatley, James	62	Sheguiandah	13½	94 50
1031	Keith, Charles	61	Bowmanville	38	228 00
1032	Carley, Abram	61	Strange	27	189 00
1033	Lemary, A.	61	Cheney Station	27	162 00
1034	Watts, Mrs. Mary	60	Baddow	22	132 00
1035	Macpherson, Crawford	65	Prescott	39½	270 50
1036	Evans, Edward Thomas	65	Huntsville	21	147 00
1037	O'Brien, Wm. J.	49	Stoco	18	108 00
1038	Spence, Margaret	44	Toronto	21	147 00
1039	Morrison, Adam	67	do	35	121 50
1040	McGregor, Alex	51	Low Banks	25½	171 00
1041	Rothwell, Benjamin	64	Listowel	42½	291 50
1042	*Levergood, Mrs. Margaret A	59	Colchester	21	126 00
1043	*Rothwell, Benjamin	60	Chatham	36½	244 50
1044	*Ritchie, David S. F	60	Chesley	37½	256 50
1045	*Decou, Rebecca	65	Hamilton	47½	331 00
1046	*Bigelow, Geo	60	Cornwall	28	188 00
1047	*McQueen, Robert	64	Kirkwall	32	224 00

As the sum of $4 is deducted from each superannuated teacher's allowance, as subscription to the fund, the payment will be $4 less in each case than as given above. *Allowance commences with 1900.

APPENDIX F.—*DEPARTMENTAL EXAMINATIONS, 1899.*

1. Continuation Classes and Public School Leaving Examinations.

Name of Inspector.	Jurisdiction.	Name of Principal.	Professional Certificate.	No. of Teachers.	Class of School. Reg. 21.)	Name of School.	No. of pupils attending who had passed examinations before 1899.		No. of other successful candidates at P.S.Leav. Exam. from schools in municipalities having no High Schools.	Schools in municipalities having H. S. from which pupils not attending such H. S. were successful at the Public School leaving examination.
							H. S. entrance.	P. S. leaving.		
M. J. Kelly	Brant	A. E. Green	I.	3	B	8 Dumfries, S.	16	9	27	
		A. A. Langs	II.	1	C	11 Burford	5	5		
		Caroline Fyle	II.	1	C	21 "	3	1		
W. S. Clendening	E. Bruce	D. F. Ritchie	II.	7	A	Chesley, V.	29	13	46	
		J. W. Ward	II.	3	B	14 Carrick	7	3		
A. Campbell	W. Bruce	W. J. Chisholme	I.	6	A	Paisley, V	30	14	72	
		D. D. Yule	I.	4	B	Lucknow, V.	10	4		
		E. S. Coultes	I.	3	B	10 Huron	14	4		
		John Shaw	I.	5	B	Teeswater, V.	15	6		
		J. D. Campbell	II.	1	C	12 Culross	6	3		
		Joseph Stalker	II.	1	C	10 Kinloss	5	7		
R. H. Cowley	Carleton								64	
N. Gordon	Dufferin	D. Campbell	II.	5	A	Grand Valley, V	12	3	35	
		R. A. Winter	II.	3	A	Horning's Mills	12	4		
		M. H. Langs	I.	6	A	Shelburne, V.	15	14		
		C. McKenzie	III.	1	C	6 Mulmur	1	4		
		A. B. Steer	I.	2	C	17 Mono	4	3		
A. Brown	Dundas	E. M. Hill	I.	6	A	Winchester, V	27	8	43	
		S. W. Hill	I.	4	A	Chesterville, V	14	6		
W. E. Tilley	Durham	D. Hampton	II.	4	A	Millbrook, V.	30	10	29	
		H. Simpson	I.	3	B	Orono	12	3		
W. E. Tilley (1898)	[1]Durham	H. Simpson	I.	3	B	Orono	10	4	3	
W. Atkin	[1]Elgin	W. Wallis	II.	4	A	5 Aldboro'	16	4	111	
		J. L. Garvin	I.	4	A	6 "	15	4		
		J. W. Brown	II.	2	B	9 Southwold	12	8		
		J. McFadyen	II.	2	B	12 "	10	2		
		J. W. McRoberts.	I.	3	B	Belmont	17	5		
		G. Stewart	II.	3	B	Springfield, V	19	9		
		A. H. Nevills	II.	2	C	18 Bayham	7	2		
		F. Lyon	II.	2	C	7 Yarmouth	8	1		
T. Girardot	N. Essex								10	
D. A. Maxwell	S. Essex	J. A. Porter	I	4	A	4 Tilbury, W.	12	1	27	
		F. J. Voaden	II.	6	B	Kingsville, V.	12	3		
		[2]A. K. Walker	III.	4	B	Amherstburg, T.	10	2		

W. Spankie	Frontenac								18	
D. McDiarmid	Glengarry								17	
A. Grier	E. Grey	E. E. Farewell	I.	5	B	Thornbury, T	12	1		
		T. M. Galbraith	III.	2	B	4 Euphrasia	9	2		
		W. J. Dowks	II.	2	B	13 Collingwood	11	1	11	
		S. B. Hatch	I.							
		T. A. Wright	II.	2	C	5 "	4	1		
		R. M. Black	III.	2	C	5 Euphrasia	5	2		
		A. E. Armstrong	III.	2	C	3 "	2	3		
N. W. Campbell	S. Grey	T. Allan	I.	6	A	Durham, T	24	15		
		T. H. Blacklock	II.	4	B	Dundalk, V	15	4		
		J. S Rowe	II.	4	B	Markdale V	23	7	69	
		J. W. Brown	I.	6	B	Hanover	16	8		
		G. W. Slaughter	II.	3	C	Flesherton	5	3		
		W. J. Blakeston	II.	2	C	Priceville	6	3		
T. Gordon	W. Grey								14	
C. Moses	Haldimand	D. Duff	II.	4	A	10 Walpole	30	12	37	
S. Phillips	Haliburton, etc.								44	
J. S. Deacon	Halton	W. F. Inman	I.	7	A	Milton, T	23	28	63	
W. MacKintosh	N. Hastings								9	
J. Johnston	S. Hastings								52	
D. Robb	E. Huron	A. H. Musgrove	II.	8	A	Wingham, T	34	17		
		I. H. Cameron	I.	4	B	Brussels, V	27	15		
		A. H. Plummer	II.	4	B	Blyth, V	16	5		
		A. McEwen	II.	2	B	4 Turnberry	12	3		
		G. E. McKee	II.	2	B	7 Howick	10	3		
		D. Fraser	II.	1	C	9 Turnberry	5	3	77	
		I. D. E. Henry	II.	1	C	4 Morris	5	1		
		T. G. Shearer	II.	1	C	5 Howick	5	1		
		W. H. Robinson	II.	2	C	7 Grey	6	2		
		C White	II.	1	C	7 McKillop	5	1		
		W. Watters	II.	2	C	17 Howick	6	2		
J. E. Tom	S. Huron	S. J. A. Boyd	I.	7	A	Exeter, V	24	7		
		W. McKay	II.	3	B	Hensall, V	14	2		
		T. G. Allen	II.	2	B	8 Ashfield	10	6		
		G. Bloomfield	II.	3	C	5 Stephen	6	2		
		W. Baird	III.	2	C	10 Stanley	9	4	84	
		J. C. Martin	III.	1	C	4 Wawanosh, W	6	2		
		J. Tigert	I.	1	C	2 Colborne	5	1		
		G. W. Holman	II	2	C	Bayfield, V	9	1		
W. H. G. Colles	E. Kent	J. McPherson	II.	4	B	Bothwell, T	12	2		
		J. C. Hamilton	II.	8	B	Blenheim, T	15	5		
		P. B. Fetterly	II.	4	B	Highgate	15	2	69	
		J. G. Cameron	II.	4	B	Thamesville, V	13	6		
		O. R. Edwards	II.	2	C	2½ Harwich	9	1		
R. Park	W. Kent	J. W. Plewes	I.	10	A	Wallaceburg, T	73	42		
		G. A. Millar	I.	8	A	Dresden, T	31	13		
		W. A. Hutton	II.	3	B	Tilbury, V	12	4	75	
		K. Schwemler	III.	2	C	Merlin	9	5		
		L. McCoig	III.	1	C	8 Chatham	6	4		
		G. Stewart	III.	1	C	11 Dover	5	2		

APPENDI F.

Name of Inspector.	Jurisdiction.	Name of Principal.	Professional Certificates.	No. of Teachers.	Class of School. (Reg. 21.)	Name of School.	No. of pupils attending who had passed examinations before 1899		No. of other successful candidates at P.S Leaving Exam. from schools in municipalities having no High Schools.	Schools in municipalities having H.S. from which pupils not attending such H.S were successful at the Public School Leaving Examinations.
							H. S. Entrance.	P.S. Leaving.		
C. A. Barnes	1. Lambton	C. B. Latta	II.	5	A	Alvinston, V	20	5	47	
		C. H. Barnes	II.	3	B	Arkona, V	18	7		
J. Brebner	2. Lambton	H. J. Beaton	II.	5	A	Oilsprings, V	13	12	21	
		J. J. Wilson	II.	2	B	17 Enniskillen	10	5		
		J. B. Colton	II.	3	C	11 Moore	7	2		
		T. Jarrott	II.	2	C	18 "	8	2		
F. L. Michell	Lanark	R. Beatty	II.	5	A	Lanark, V	29	13	23	
		J. L. Bryant	I.	3	B	4 Pakenham	10	4		
		M. Ellis	II.	1	C	5 "	7	3		
W. Johnston	1. Leeds	D. Hicks	B.A.	3	C	4 Crosby, N	8	4	31	
		H. Holbrook	I.	3	C	Newboro', V	7	2		
		R. Hanna	II.	2	C	5 Crosby, S	6	1		
R. Kinney	2. Leeds								10	
T. A. Craig	3. Leeds								19	
F. Burrowes	Lennox and Addington.	J. Morgan	I.	3	B	Bath, V	17	14	19	
J. B. Grey	Lincoln								12	
J. Dearness	E. Middlesex								64	
H. D. Johnson	W. Middlesex								38	
J. J. Wadsworth	Norfolk	J. E. Hodgson, B.A.	I	4	B	Delhi, V	12	4	59	
A. Odell	Northumberland	W. J. Wright		4	A	Warkworth	19	14	55	
J. McBrien	N. Ontario	R. J. Johnston	II.	5	A	Cannington, V	21	2	38	
J. Waugh	S. Ontario	D. McQueen	II.	2	C	Manilla	6	3	15	
W. Carlyle	Oxford	J. E. Hodgson	B.A.	5	A	Norwich, V	26	5	70	
		C. Garthwaite	II.	3	B	6 S. "	21	8		
		M. B. Hugill	II.	2	B	5 Dereham	10	3		
		J. Little	I.	3	B	11 Blenheim	15	8		
		G. Pentland	I.	3	B	24 "	10	5		
		G. R. Theobold	I.	3	B	Embro, V	28	10		
		C. Cameron	I.	4	B	13 E. Zorra	5	1		
A. Embury	Peel	J. Graham	I.	4	A	Bolton, V	11	6	33	
		A. C. Willson	II.	2	B	15 Caledon	7	5		
W. Irwin	Perth	A. L. McLennan	B.A. Int.	3	B	Milverton, V	10	1	55	2
		D. Ross	I.	1	C	2 N. Easthope	5	3		
J. C. Brown	Peterborough	W. A. Evans	I.	5	B	Lakefield, V			31	

W. J. Summerby	Prescott and Russell									22		
G. D. Platt	Prince Edward	J. A. Rundle	I.	2	B	11	Ameliasburgh	14	10			
		W. J. O borne	I.	2	B	7	Hallowell	13	5			
		W. K. McKibbon	II.	2	B	17	Hillier	15	8	25		
		W. R. Brown	II.	1	C	13	Hallowell	6	2			
		Mrs J. S. Palen	II.	1	C	6	N. Marysburgh	6	2			
		E. Vandusen	III.	1	C	12	S. "	8	2			
R. G. Scott	Renfrew	G. R. Wood	II.	2	B	7	Westmeath	20	10			
		J. E. McDonald	II.	1	C	2	Brudenell	6	9	66	3	
		G. E. Fletcher	III.	2	C	6	Ross	6	2			
I. Day	E. Simcoe	S. Tewkesbury	II.	3	B	7	Medonte	10	1	30		
		R. G. Nesbitt	II.	4	B	12	Tay	11	1			
J. C. Morgan	N. Simcoe	A. McKee	I.	11	A		Midland, T	16	5			
		J. Slaughter	II	4	B		Elmvale	7	5	30	19	
		W. Burkholder	II.	2	B	9	Vespra	10	2			
		M. Johnstone	II.	1	C	3	Sunnidale	7	4			
T. McKee	S. Simcoe	W. Sparks	I.	6	A		Alliston, T	36	21			
		J. A. McPherson	II.	4	A		Beeton, V	25	13			
		H. J. Brown	I.	4	A		Cookstown	24	13			
		T. Gowan	II.	4	A		Creemore, V	22	12			
		A. N. Scarrow	I	6	A		Stayner, T	28	10			
		T. E. Langford	M.A.	3	A		Tottenham, V	30	14			
		N. S. McEachern	II.	2	C		Angus	6	3			
		G. Sutherland	II.	2	C		Avening	6	2			
		W. L. Kidd	I.	2	C		Duntroon	7	2	109		
		J. E. Holt	II.	2	C		Newton-Robinson	6	1			
		C. Deering	II.	1	C		Stroud	7	1			
		T. J. Ryan	II.	1	C		Loretto	5	1			
		T. Irwin	II.	1	C		Airlie	5	1			
		R. Little	II.	1	C		Killyleagh	6	2			
		W. Bradley	I.	1	C		Glencairn	5	2			
		J. A. Corbett	II.	1	C	9	Innisfil	5	1			
		W. Bell	III.	3	C	2	Tossorontio	5	2			
A. McNaughton	Stormont	H. B. Fetterly	I.	3	A	14	Roxboro	14	2			
		J. Froats	I.	3	A	3	Finch	13	2	28		
		R. A. Baker	III.	3		4	Osnabruck	14	2			
J. H. Knight	E. Victoria	W. Hickson	II.	4	B		Bobcaygeon, V	4	3	19	5	
H. Reazin	W. Victoria	C. Lapp	II.	2	B	8	Mariposa	5	10			
		C. H. Maybee	II	6	B		Fenelon Falls, V	7	6	68		
		E. Mosgrove	II.	2	B		Kirkfield	6	6			
		G. H. O. Thomas	II.	8	B		Bracebridge, T	12	10			
T. Pearce	Waterloo	T. G. Baker	II.	6	B		Elmira, V	11	2	23	3	
J. H. Ball	Welland	E. E. Dadson	I.	4	A		Bridgeburg, V	14	10			
		A. Ross	II.	3	B		Fort Erie, V	8	8	62		
		C. E. Hansel	II.	3	B	11	Bertie	12	6			
D. Clapp	N. Wellington	D. Forsyth	II.	8	A		Palmerston, T	29	10			
		G. A. Campbell	II.	4	A		Drayton, V	16	8			
		J. A. Gray	II.	3	B		Clifford, V	12	4	33		
		C. Long	II.	2	C	2	Peel	6	2			
		Mary Duncan	II.	2	C	12	Maryboro	8	3			

Name of Inspector.	Jurisdiction.	Name of Principal.	Professional Certificates.	No. of Teachers.	Class of School. (Reg. 21.)	Name of School.	No. of pupils attending who had passed examinations before 1899.		No. of other successful candidates at P.S. Leaving Exam. from schools in municipalities having no High Schools.	Schools in municipalities having H.S. from which pupils not attending such H.S. were successful at the Public School Leaving Examinations.
							H. S. Entrance.	P.S. Leaving.		
J. J. Craig	S. Wellington	H. N. Awrey	II.	4	A	Erin, V	13	13		
		J. Strachan	II.	3	B	Rockwood	10	6		
		N. L. Smith	II.	1	C	2 Guelph	5	4	32	
		W. F. Mackenzie	II.	1	C	3 "	3	2		
		W. H. Rowan	II.	2	C	6 Erin	6	3		
		D. Mackenzie	II.	2	C	7 Garafraxa, W	5	3		
J. H. Smith	Wentworth	F. McCallum	I.	2	B	6 Ancaster	10	1		
		B. French	B.A.	2	B	2 Glanford	10	5	48	
		J. Corrigill	I.	2	C	9 Flamboro, W	6	3		
		C. E. Kelly	I.	3	C	3 Saltfleet	8	1		
A. B. Davidson	N. York	A. Wilkinson	II.	3	B	14 King	6	7	21	
D. Fotheringham	S. York	K. Langdon	II.	4	A	Woodbridge, V	12	4	31	
D. McCaig	Algoma	T. H. Roberts	I.B.A.	10	A	Rat Portage, T	41	3		
		L. A. Green	I.B.A.	8	A	Sault Ste. Marie, T	30	12	29	
		R. O. White	I.	4	A	Gore Bay, T	6	2		
G. Grant	Nipissing and Parry Sound	J. B. McDougall	I.B.A.	6	A	North Bay, T	15	10		
		A. M. Currie	I.	10	A	Parry Sound, T	22	19		
		P. H. Thebaudeau	I.	2	B	Mattawa, T	6	5	42	
		J. A. Ross	II.	2	B	Sudbury, T	9	4		
		W. A. Baker	II.	2	C	2 McKim	6	1		
W. H. Ballard	Hamilton									49
W. G. Kidd	Kingston									1
J. C. Glashan	Ottawa									53
W. F. Chapman	Toronto									184
	Welland								4	
J. F. White	R. C. S. S. Inspector	Sr. S. Scholastica		4	A	Eganville, V	22	9	22	24
		Sr. S. Andrew		3	B	4 Crosby, N	10	7		
W. Prendergast	R. C. S. S. Inspector	F. D. Henderson	II.	5	B	Mattawa, T	6	4	27	13

2 Admission of Candidates to Collegiate Institutes and High Schools.

Name of School.	Entrance Examination, June, 1899.		Public School Leaving Examination, June, 1899.		
	Examined.	Passed.	Examined.	Passed.	Passed Entrance on Public School Leaving Papers.
Alexandria	77	35	5	2	
Almonte	50	30	9	4	
Arnprior	49	30	7	3	3
Arthur	46	37	3	3	
Athens	92	37	18	9	3
Aurora	56	43	5	1	1
Aylmer C.I.	129	80	22	10	12
Barrie C.I.	77	57	25	9	11
Beamsville	53	35			
Belleville	236	144	26	23	
Berlin	146	125	8	4	
Bowmanville	64	47	14	6	8
Bradford	35	28	9	6	1
Brampton	101	61	12	5	6
Brantford C.I.	216	107	37	20	14
Brighton	33	30	5	4	
Brockville C.I.	126	100	5	1	4
Caledonia	51	34	5	3	2
Campbellford	55	36	4	4	
Carleton Place	89	60	2	2	
Cayuga	56	33	6	4	1
Chatham C.I.	121	95	13	8	5
Clinton C.I.	72	64	21	13	6
Cobourg C.I.	82	54	6	5	1
Colborne	42	28	11	9	
Collingwood C.I.	80	58	1	1	
Cornwall	116	93	12	5	7
Deseronto	41	27	7	6	1
Dundas	65	45	2	2	
Dunnville	70	39	8	4	4
Dutton	46	39	21	15	6
Elora	31	22	3	1	
Essex	50	23	2	2	
Fergus	65	44	22	15	3
Forest	41	31	2	2	
Galt C.I.	136	87	17	9	3
Gananoque	68	34	11	7	4
Georgetown	43	28	15	7	4
Glencoe	70	55	9	7	1
Goderich C.I.	69	58	19	13	1
Gravenhurst	55	26	13	5	
Grimsby	29	22			
Guelph C.I.	129	114	2	1	1
Hagarsville	40	29	6	6	
Hamilton C.I.	464	350	123	46	12
Harriston	30	23	4	4	
Hawkesbury	22	19			
Ingersoll C.I.	93	53	6	4	2
Iroquois	74	39			
Kemptville	48	24	15	6	8
Kincardine	52	45	5	4	
Kingston C.I.	176	147	10	1	9
Leamington	73	30	2	2	0
Lindsay C.I.	85	62	13	10	
Listowel	70	49	19	10	9
London C.I.	376	300			0
Lucan	106	60	15	10	1
Madoc	73	39	8	6	
Markham	132	104	20	14	6
Meaford	48	33	11	7	2
Mitchell	71	50	6	4	2
Morrisburg C.I.	93	52	17	12	
Mount Forest	53	39	16	10	6

2. Admission of Candidates to Collegiate Institutes and High Schools

Name of School.	Entrance Examination, June, 1899.		Public School Leaving Examination, June, 1899.		
	Examined.	Passed.	Examined.	Passed.	Passed Entrance on Public School Leaving Papers.
Napanee C.I.	124	56	8	6	2
Newburgh	105	58	7	6	1
Newcastle	19	13	2	2	
Newmarket	51	38	8	5	3
Niagara	19	18			
Niagara Falls C.I.	68	57	1	1	
Niagara Falls, South	39	34			
Norwood	74	48	19	4	
Oakville	39	24	13	7	5
Omemee	32	19	14	12	
Orangeville	69	40	16	7	
Orillia	79	34	21	14	7
Oshawa	79	51	6	3	3
Ottawa C.I.	257	179	118	70	44
" Water street Convent			20	20	
Owen Sound C.I.	125	63	16	8	5
Paris	68	48	3		3
Parkhill	96	49	16	10	5
Pembroke	92	52	22	16	5
Perth C.I.	101	74	7	3	
Peterborough C.I.	167	98	6	4	2
Petrolea	73	47			
Picton	153	86	22	17	1
Port Arthur	33	18			
Port Dover	32	24	1		
Port Elgin	61	47	3	2	
Port Hope	59	44	5	2	3
Port Perry	58	40	17	5	12
Port Rowan	39	20	6	4	
Prescott	59	38			
Renfrew	124	78	40	28	11
Richmond Hill	65	44			
Ridgetown C.I.	81	51	20	7	5
Sarnia C.I.	147	71	9	4	5
Seaforth C.I.	53	29	6	3	2
Simcoe	105	60	28	17	9
Smith's Falls	60	45			
Smithville	35	23	6	5	1
Stirling	152	24	4	1	
Stratford C.I.	170	116	16	13	2
Strathroy C.I.	572	82	44	13	9
Streetsville	28	15	1		1
St. Catharines C.I.	115	89			
St. Mary's C.I.	98	64	20	15	1
St. Thomas C.I.	158	115			
Sydenham	70	42	9	5	1
Thorold	58	48			
Tilsonburg	72	37	13	4	6
Toronto C.I. (Harbord St.)	214	173	117	83	23
" " (Jameson Ave.)	144	107	55	27	13
" " (Jarvis St.)	168	122	100	71	25
Toronto Junction	74	46	4	3	
Trenton	45	42	3	2	1
Uxbridge	64	43	13	6	7
Vankleekhill	73	46	3	1	2
Vienna	26	14	13	9	4
Walkerton	67	45	10	9	1
Woodsville	18	16	1		1
Waterdown	35	27	8	2	3
Waterford	66	34	12	7	4
Watford	68	44	6	3	1
Welland	61	35	8	4	
Weston	49	33	16	11	5
Whitby C.I.	59	42	9	7	2
Wiarton	37	25	3	1	2
Williamstown	88	44	18	12	4
Windsor C.I.	189	115			
Woodstock C.I.	156	104	31	22	9

2. Admission of Candidates to Collegiate Institutes and High Schools.

Name of School.	Entrance Examination, June, 1899.		Public School Leaving Examination, June, 1899.		
	Examined.	Passed.	Examined.	Passed.	Passed Entrance on Public School Leaving Papers.
Other places.					
Aberfoyle	29	15	13	6	
Allandale					
Allenford	20	5	3	2	1
Alliston	28	25	32	19	13
Alvinston	50	25	18	11	5
Ameliasburg	40	31	13	11	
Amherstburg	44	16	10	7	3
Ancaster	26	14	20	15	5
Angus	17	14	6	4	2
Arkona	21	15	10	9	1
Avonmore	35	19	11	8	3
Ayr	15	10	17	9	3
Bancroft	15	7	2	2	
Bath	43	17	10	7	3
Bayfield	16	12	6	5	
Belle River	33	16	13	11	2
Beaverton	24	9	15	7	6
Beeton	13	9	12	11	1
Belmont	44	27	18	15	3
Binbrook	29	21	15	9	5
Blackstock	22	14	8	3	4
Blenheim	31	16	27	20	6
Blyth	20	13	8	5	2
Bobcaygeon	15	4	5	2	
Bolton	24	15	25	19	6
Bothwell	21	16	11	10	1
Bracebridge	34	24	25	21	
Bridgeburg	21	19	16	14	
Brigden	25	10	8	2	6
Bruce Mines	10	6	3	1	
Brussels	48	37	29	24	5
Burk's Falls	31	20	19	13	5
Burlington	34	25	13	12	1
Burritt's Rapids	9	2	2		2
Cannington	40	30	29	18	11
Cardinal	18	4	9	2	5
Castleton	9	5	14	11	
Chapleau	5	3	1	1	
Charleston	31	9	16	4	11
Chatsworth			5	1	3
Chesley	32	21	27	24	3
Claremont	22	15	8	7	1
Clifford	8	4	6	1	5
Comber	25	14			
Cookstown	23	15	28	22	6
Courtright	13	9	6	3	3
Creemore	34	32	23	16	7
Crediton	23	15	5	5	
Crosshill	20	9	6	4	
Cumberland	22	16	7	2	5
Delhi	41	33	25	20	4
Delta	33	7	15	5	4
Drayton	24	14	12	9	3
Dresden	41	32	9	7	2
Drumbo			10	5	1
Dundalk	42	13	20	9	4
Dungannon	20	16	11	8	3
Durham	57	41	39	28	9
Eganville	47	23	48	28	20
Eglinton	21	14	7	1	
Elmira	8	5	2		
Elmvale	28	21	11	3	6
Emo	4	2			
Embro	25	18	24	22	2
Erin	37	22	23	19	2
Exeter	47	42	25	22	3
Fenelon Falls	37	15	27	15	

2. Admission of Candidates to Collegiate Institutes and High Schools.

Name of School.	Entrance Examination, June, 1889.		Public School Leaving Examination, June, 1889.		
	Examined.	Passed.	Examined.	Passed.	Passed Entrance on Public School Leaving Papers.
Fingal	59	30	39	23	16
Flesherton	40	25	13	5	4
Flinton					
Florence	43	26	11	9	2
Fordwich	15	8	8	6	
Fort William	14	12			
Glen Allan	12	5	10	5	4
Gore Bay	15	10	11	10	1
Grand Bend					
Grand Valley	36	14	16	12	2
Hanover	4	4	20	14	5
Harrow	18	6	9	4	3
Hastings	27	13	2	2	
Hensall	18	11	12	11	1
Hepworth	7	1	3	2	1
Highgate	24	6	16	13	2
Hillsdale	14	10	3	3	
Horning's Mills	5	2	10	7	3
Huntsville	18	10	14	12	2
Jarvis	29	23	23	21	2
Kimberley	14	7	9	4	4
Kingsville	28	22	13	12	1
Kintail	22	17	6	3	2
Kirkfield	26	13	28	15	
Lakefield	58	30	18	12	
Lanark	45	23	15	5	2
Lancaster	14	12	9	7	1
Little Current	5	4	2	1	
Lion's Head	9	4	2	1	
London East	216	113	75	53	3
Lucknow	25	19	14	9	
Manitowaning	9	7	6	4	2
Markdale	26	15	15	7	4
Marshville	33	22	30	21	
Marsville	4	3	1	1	
Mattawa	23	13	24	8	8
Maxville	46	21	5	3	2
Merlin	27	20	11	8	2
Merrickville	24	10	14	6	8
Metcalfe	25	19	22	15	6
Midland	37	13	5	3	2
Millbrook	61	46	14	11	3
Milton	71	46	48	38	
Milverton	27	14	25	20	4
Minden	10	8	28	20	8
Moorefield	8	3	8	5	3
Mount Hope	15	8	14	7	7
Newboro	33	12	21	14	
New Hamburg	25	17	7	3	
Neustadt	4	3	3		2
North Augusta	14	3	4	4	
North Bay	52	35	17	14	
Norwich	61	37	2	2	
Oakwood	31	17	16	11	
Oil Springs	27	14	7	6	1
Orono	23	12	5	2	3
Paisley	48	34	26	22	
Pakenham	42	20	18	13	1
Palmerston	33	26	14	6	8
Parry Sound	43	32	18	17	
Pelee Island	2	1	3		
Pelham, S. S. No. 2	31	25	17	14	
Penetanguishene	17	10	13	11	2
Plantagenet	32	14	13	8	5
Plattsville	30	19	8	7	1
Port Stanley	19	12	14	10	4
Raleigh, S. S. No. 10	10	2	9	5	3
Randwick	9	2	3	2	1

2. Admission of Candidates to Collegiate Institutes and High Schools.

Name of School.	Entrance Examination, June, 1899.		Public School Leaving Examination, June, 1899.		
	Examined.	Passed.	Examined.	Passed.	Passed Entrance on Public School Leaving Papers.
Rat Portage	41	33	2	2	
Richmond	66	40	34	28	6
Ridgeway	40	31	17	12	
Ripley	30	27	11	10	
Rockton	32	21	12	9	3
Rockwood	18	12	11	8	
Rodney	36	29	14	14	
Rosemont	2	1	1		
Russell	17	12	17	12	5
Sault Ste. Marie	28	15	12	12	
Schomberg	6	4	10	7	3
Schrieber	9	5	1	1	
Selkirk	33	21	7	5	2
Sharbot Lake	11	8	10	7	
Shelburne	26	9	20	10	
South Finch	46	26	11	7	4
Sparta	23	9	14	6	8
Spencerville	26	8	8	5	3
Springfield	22	19	15	7	8
St. Helen's	11	7	4	4	
Stayner	38	32	15	12	3
Stoney Creek	45	32	7	6	1
Strabane	20	13	5	1	4
Stroud	28	20	11	9	2
Sturgeon Falls	2	2	10	3	
Sudbury	17	12	14	8	1
Sutton West	22	18	12	6	6
Tara	16	10	9	7	1
Tecumseth	26	12	6	3	3
Teeswater	35	28	18	15	
Thamesville	36	19	37	20	12
Thedford	25	19	7	7	
Thessalon	15	5	3	1	
Thornbury	41	26	4	3	1
Tilbury Centre	10	7	17	13	3
Tiverton	13	7	7	7	
Tottenham	37	28	32	23	9
Tweed	55	27	28	24	
Uptergrove	37	26	20	7	13
Wallaceburg	48	33	34	29	5
Warkworth	31	27	17	12	1
Waubaushene	32	22	14	9	
Webbwood	8	4	1		1
West Lorne	23	20	9	8	1
Westport Separate School	27	12	14	5	
West Winchester	116	58	58	35	1
Wheatley	17	9	11	9	2
Wilkesport	24	9	6	3	3
Wingham	56	41	34	28	4
Woodbridge	16	7			
Wolfe Island	31	23	7	4	1
Wooler	15	13	9	7	2
Wroxeter	28	22	9	8	1
Wyoming	40	28	16	12	4
Zephyr	11	6	4	3	1
Zurich	25	19	9	8	1
Summary.					
Collegiate Institutes	5,223	3,645			
High Schools	5,881	3,784			
Other Places	5,205	3,175			
Grand total	16,309	10,604	4,368	2,825	933
Comparison with June, 1898.					
Increase		993			
Decrease	552		912	845	397

Name of Institute.	Number of Institutes.	Number of members.	Government grants.	Municipal grants.	Members' fees.	Balances and other sources.	Total receipts.	Printing, postage, etc.	Libraries, educational journals, etc.	Miscellaneous.	Total expenditure.	Balances.
			$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Algoma, E	1	43	25 00	.....	.....	4 00	29 00	10 40	16 45	.....	26 85	2 15
" W	1	25	25 00	.....	.....	51 56	76 56	2 46	69 01	.....	71 47	5 09
Brant	1	150	25 00	25 00	.....	141 34	191 34	4 55	8 09	34 45	47 09	144 25
Bruce, E	1	126	25 00	25 00	.....	71 98	121 98	13 46	.....	82 68	96 14	25 84
" W	1	38	25 00	25 00	9 50	165 09	224 59	16 44	26 75	63 70	106 89	117 70
Carleton	1	134	25 00	.....	.....	47 55	72 55	5 88	.....	41 00	46 88	25 67
Dufferin	1	115	25 00	25 00	9 25	.....	59 25	14 10	12 88	32 27	59 25	.....
Dundas	1	72	25 00	.....	.....	61 17	86 17	24 97	.....	46 55	71 52	14 65
Durham	1	120	25 00	25 00	.....	111 98	161 98	7 92	19 75	19 30	46 97	115 01
Elgin	1	150	25 00	50 00	.....	42 90	117 90	6 50	.....	25 00	31 50	86 40
Essex, N	1	65	25 00	50 00	.....	76 03	151 03	17 50	.....	79 00	96 50	54 53
" S	1	106	25 00	50 00	.....	99 56	174 56	24 68	.....	11 00	35 68	138 88
Frontenac	1	147	25 00	25 00	.....	29 18	79 18	3 64	.....	38 48	42 12	37 06
Grenville (3 Leeds)	1	100	25 00	.....	.....	19 74	44 74	3 42	.....	21 90	25 32	19 42
Grey, E. (N)	1	32	25 00	25 00	8 00	60 27	118 27	.....	.....	51 40	51 40	66 87
" W	1	88	25 00	25 00	.....	49 97	99 97	14 30	7 50	28 30	50 10	49 87
" S	1	64	25 00	25 00	16 00	253 19	319 19	9 85	65 80	78 35	154 00	165 19
Glengarry	1	92	25 00	25 00	.....	27 39	77 39	21 33	.....	16 15	37 48	39 91
Haliburton	1	25	25 00	25 00	.....	64 45	114 45	2 27	9 25	27 10	38 62	75 83
Hastings, N	1	108	25 00	.....	.....	102 61	127 61	12 07	6 00	65	18 72	108 89
" S	1	133	25 00	25 00	.....	268 68	318 68	9 00	.....	18 00	27 00	291 68
Haldimand	1	125	25 00	25 00	.....	184 39	234 39	6 90	25 00	31 65	63 55	170 84
Halton	1	90	25 00	25 00	.....	150 63	200 63	10 71	26 71	36 61	74 03	126 60
" E (N)	1	132	25 00	25 00	.....	119 23	169 23	4 00	.....	71 50	75 50	93 73
" W (S)	1	32	25 00	25 00	13 00	37 86	100 86	7 08	12 00	40 30	59 38	41 48
Kent, E	1	85	25 00	25 00	.....	103 03	153 03	5 48	.....	64 00	69 48	83 55
" W (C. D.)	1	135	25 00	25 00	23 50	51 00	124 50	15 21	1 92	59 60	76 73	47 77
Lambton, E. (1)	1	114	25 00	25 00	48 50	22 30	120 80	29 94	.....	25 97	55 91	64 89
" W. (2)	1	124	25 00	25 00	.....	64 78	114 78	28 69	.....	17 10	45 79	68 99
Lanark	1	175	25 00	25 00	30 00	144 53	224 53	1 30	66 75	32 00	100 05	124 48
Lennox and Addington	1	131	25 00	25 00	.....	73 10	123 10	6 75	50 88	22 24	79 87	43 23
Leeds, E (2)	1	130	25 00	25 00	18 50	218 58	287 08	16 61	57 40	28 10	102 11	184 97
Leeds, W. (1)	1	101	25 00	25 00	.....	98 65	148 65	5 33	30 75	25 45	61 53	87 12

Lincoln	1	112	25 00	25 00		177 73	227 73	7 65		35 00	42 65	185 08
Muskoka	1	75	25 00			77 25	102 25	3 70		12 65	16 35	85 90
W. and E. Simcoe	1	112	25 00	25 00		91 49	141 49		34 45	33 94	68 39	73 10
Middlesex, E.	1	97	25 00	95 00	24 25	42 88	187 13	108 49	29 60	35 75	173 84	13 29
" W.	1	107	25 00	75 00	50 50	32 22	182 72	47 29		81 25	128 54	54 18
Manitoulin	1	23	25 00			35 54	60 54	80	18 71	15 72	35 23	25 31
Nipissing	1	20	25 00		8 75	15 58	49 33	1 02	24 00	10 00	35 02	14 31
Norfolk	1	139	25 00	50 00		90 19	165 19	41 76		18 75	60 51	104 68
Northumberland	1	145	25 00	25 00		246 16	296 16	8 50	7 80	71 75	88 05	208 11
Ontario	1	155	25 00	25 00		77 67	127 67	4 75		58 10	62 85	64 82
Oxford	1	186	25 00			68 22	93 22	6 19		21 99	28 18	65 04
Parry Sound, E	1	28	25 00		7 25	24 12	56 37	7 57		46 05	53 62	2 75
" W	1	40	25 00		5 25	34 45	64 70	9 09		20 61	29 70	35 00
Peel	1	99	25 00	25 00		68 76	118 76	88 50		28 50	117 00	1 76
Perth	1	176	25 00	25 00		131 86	181 86	10 50	3 60	1 2 40	146 50	35 36
Peterborough	1	112	25 00	25 00		93 58	143 58	3 60	60 00	39 20	102 80	40 78
Prescott and Russell	1	118	25 00	25 00		43 29	93 29	40 46	90	25 05	66 41	26 88
Prince Edward	1	90	25 00	25 00		138 37	188 37	8 10	34 35	42 75	85 20	103 17
Renfrew	1	56	25 00	25 00		81 03	131 03	11 75	13 00	63 65	88 40	42 63
Simcoe, N	1	119	25 00	75 00		62 97	162 97	63 17		42 95	106 12	56 85
" S	1	100	25 00	25 00	25 00	189 86	264 86	21 50		43 25	64 75	200 11
Stormont	1	54	25 00	25 00	24 75	17 56	92 31	9 88	19 50	26 90	56 28	36 03
Victoria, E	1	96	25 00	37 50		109 66	172 16	4 70	5 50	66 72	76 92	95 24
" W	1	75	25 00	25 00		20 16	70 16	6 00	10 50	24 00	40 50	29 66
Waterloo	1	49	25 00	50 00	26 00	35 34	136 34	10 99		88 00	98 99	37 35
Welland	1	146	25 00	25 00		107 66	157 66	7 69		46 25	53 94	103 72
Wellington, N	1	110	25 00	25 00	15 50	97 32	162 82	14 61	64 72	20 00	99 33	63 49
" S	1	115	25 00	25 00		87 77	137 77	8 10		63 75	71 85	65 92
Wentworth	1	107	25 00	25 00	11 50	89 83	151 33		20 85	27 90	48 75	102 58
York, N	1	73	25 00	50 00	18 25	63 57	156 82	9 23	65 85	17 00	92 08	64 74
" S	1	52	25 00	25 00	26 00	177 01	253 01	39 70	64 38	34 00	138 08	114 93
Guelph	1	34	25 00	25 00		63 50	113 50	41	40 75	5 10	46 26	67 24
Hamilton	1	171	25 00	25 00		81 06	131 06	25 75		55 00	80 75	50 31
Kingston	1	60	25 00	25 00	6 50	54 00	110 50	6 73	33 55	3 50	43 78	66 72
London	1	161	25 00	25 00	41 00	99 77	190 77	15 10	45 72	66 00	126 82	63 95
Ottawa	1	150	25 00	25 00		47 70	97 70	2 03		59 10	61 13	36 57
St. Catharines	1	25	25 00	25 00		73 98	123 98		68 06	7 90	75 96	48 02
St Thomas	1	41	25 00	25 00		56 96	106 96	2 75	73 75	3 48	79 98	26 98
Toronto	1	660	25 00	25 00	127 25	715 84	893 09	27 91	274 41	312 17	614 49	278 60
Windsor and Walkerville	1	63	25 00	25 00		73 71	123 71	4 04		37 00	41 04	82 67
P. & R. Fr.-Eng. T. S	1	80	25 00				25 00					25 00
Ontario Educational Asssociation	1	500	600 00		282 25	333 40	1,215 65	694 88		246 25	941 13	274 52
Dominion Teachers' Association			200 00				200 00			200 00	200 00	
Total, 1898	75	8,238	2,650 00	1,857 50	876 25	7,245 74	12,629 49	1,747 63	1,526 84	3,459 13	6,733 60	5,895 89
" 1897	73	7,627	2,425 00	2,017 45	901 15	7,122 60	12,466 20	1,607 94	1,479 88	3,511 02	6,598 84	5,867 36
Increase	2	611	225 00			123 14	163 29	139 69	46 96		134 76	28 53
Decrease				159 95	24 90					51 89		

Name of Model School.	Name of Principal.	Certificate of Principal.	Salary of Principal.	Year of appointment.	Time Principal devotes to Model School work during the term.	No. of assistants with 1st class certificates.	No. with 2nd class.	No. with 3rd class.	No. with other class.	What time did assistant relieve a Principal from public work?	Is separate room provided?	Is there a professional library? No. of volumes.	Government grants.	Municipal grants.	Fees.	No. of divisions in school.	No. of Divisions used for Model School purposes.	No. of pupils sent at one time to observe or teach.	Length of time students are trained before being sent to the division to observe.	Length of time students are trained before being sent to the divisions to teach.
			$										$	$	$					
Athens	R. Thompson	I.	700	1896	all day	....	3	...	...	all day	1	41	150	150	125	4	4	6	6 w	6 w
Barrie	W. J. Hallett	I.	900	1893	"	1	8	....	....	"	1	45	150	150	160	9	9	3	6 w	6 w
Beamsville	J. R. Bulmer	I.	600	1898	"	1	3	...	...	"	1	75	150	150	100	4	4	6	6 w	6 w
Berlin	J. Suddaby	I.	1,150	1877	"	1	5	4	....	"	1	45	150	150	50	12	10	6	6 w	6 w
Bracebridge	G. H. O. Thomas	I.N.P.	650	1885	"	1	4	3	...	"	1	108	150	....	65	9	8	6	5 w	6 w
Bradford	A. Orton	I.	750	1888	"	1	3	...	....	"	1	46	150	150	72	4	4	4	6 w	7 w
Brampton	A. Barber	I.	800	1894	"	1	9	...	....	"	1	40	150	250	69	10	10	4	6 w	8 w
Brantford	W. Wilkinson	M.A.	1,275	1872	5½ h	2	13	2	....	"	1	220	150	150	30	17	12	4	4 w	6 w
Caledonia	A. B. Shantz	I.	700	1895	all day	....	3	....	....	"	1	175	150	150	135	4	4	8	6 w	6 w
Chatham	T. C. Smith	I.	800	1893	"	1	9	1	....	"	1	300	150	150	215	11	10	1	6 w	7 w
Clinton	W. R. Lough	I.	825	1884	"	..	6	2	....	"	1	45	150	150	145	8	8	4	6 w	6 w
Cobourg	W. J. Hamilton	I.	810	1895	"	1	7	3	....	"	1	60	150	150	78	5	11	4	6 w	6 w
Collingwood	E. Ward	I.	950	1880	"	....	6	8	....	"	1	52	150	150	50	14	14	2	6 w	6 w
Cornwall	J. Connolly	I.	900	1892	"	1	9	....	....	"	1	50	150	150	100	11	10	3	6 w	6 w
Durham	T. Allan	I.	700	1888	"	1	3	1	1	"	1	40	150	150	105	6	5	4	6 w	8 w
Elora	L. K. Fallis	I.	650	1894	"	2	3	....	....	"	1	58	150	150	103	5	5	5	6 w	6 w
Forest	J. Campbell	I.	700	1894	"	....	5	....	....	"	1	40	150	150	150	6	6	5	6 w	6 w
Galt	R. Alexander	I.	1,000	1875	"	1	7	....	....	"	1	48	150	150	55	8	8	6	4 w	7 w
Gananoque	J. C. Linklater	I.	1,000	1888	"	....	5	6	....	"	1	51	150	150	60	12	6	3	6 w	6 w
Goderich	S. P. Halls	M.A.	900	1894	"	..	11	1	....	"	1	55	150	150	125	12	12	4	5 w	5 w
Hamilton	W. H. Elliott	B.A.	1,300	1893	"	34	93	13	10	"	1	600	150	150	120	12	11	4	4 w	4 w
Ingersoll	H. F. McDiarmid	I.	900	1885	"	2	7	3	..	"	1	46	150	50	28	13	11	3	6 w	7 w
Kincardine	F. C. Powell	I.	850	1887	6 h	1	3	2	..	6 h	1	38	150	150	85	6	6	3	3 w	6 w
Kingston	R. K. Row	B.A.	1,100	1885	all day	1	8	..	....	all day	1	160	150	150	180	8	42	4	4 w	4½ w
Lindsay	G. E. Broderick	I.	1,000	1888	"	..	19	...	....	"	1	50	150	150	167	19	17	2	3 w	5 w
London	R. M. Graham	I.	1,200	1891	"	1	9	...	....	"	1	40	150	88	165	10	10	4	5 w	6 w
Madoc	T. C. Tice	I.	700	1897	"	....	6	...	....	"	....	34	150	250	171	6	6	6	5 w	5 w
Meaford	A. A. Jordan	I.	750	1891	"	....	4	4	....	"	1	52	150	150	80	8	8	2	6 w	8 w
Milton	W. F. Inman	I.	750	1893	"	....	4	2	....	"	1	44	150	200	130	6	5	5	6 w	6 w

Minden	F. C. Gillis	II.	450	1897	"	....	1	1	....	all day	1	40	150	150	50	3	3	5	6 w	6½ w
Mitchell	C. M. French	I.	800	1893	"	...	4	3	....	"	1	40	150	150	50	7	7	2	6 w	6 w
Mt. Forest	H. Bewell	I.	700	1897	5½ h	....	7	2	....	"	1	51	150	150	130	9	9	4	6 w	6 w
Morrisburg	A. E. Meldrum	I.	700	1895	"	..	4	3	....	5½ h	1	53	150	2,611	155	7	7	5	5 w	5 w
Napanee	J. R. Brown	I.	750	1897	all day	....	7	....	2	all day	1	50	150	200	100	10	8	3	6 w	8 w
Newmarket	W. Rannie	I.	700	1877	..	1	5	....	....	"	1	60	150	175	58	6	6	2	4 w	6 w
Norwood	H. R. Scovell	B A.	640	1897	"		5	....	....	"	1	40	150	150	90	5	5	6	5 w	7 w
Orangeville	M. N. Armstrong	I.	800	1885	"	2	7	1	....	"	1	45	150	150	85	10	8	2	6 w	6 w
Owen Sound	T. A. Reid	I.	1,000	1894	"	..	12	1	...	.....	1	60	150	150	120	13	13	3	6 w	8 w
Parry Sound	A. M. Currie	I.	700	1896	.....	1	4	1	2	.....	1	42	300	... ..	95	7	7	3	6 w	7 w
Perth	M. M. Jaques	I.	1,000	1884	all day	...	6	2	1	all day	1	68	150	150	5	10	9	5	6 w	7 w
Picton	R. F. Greenlees	I.	800	1886	"	....	7	....	....	"	1	60	150	150	115	8	8	3	7 w	7 w
*Plantagenet	D. Chenay	I.	1,200	1890	½ day	....	1	....	2	..	1	60	950	400	.....	4	3	18	2 w	3 w
Port Hope	F. Wood	I.	1,000	1885	all day	....	15	....	....	all day	1	55	150	150	75	15	10	3	6 w	6 w
Port Perry	A. M. Rae	I.	800	1877	5½ h	2	2	2	....	"	1	50	150	150	75	6	6	4	6 w	7 w
Prescott	C. Macpherson	I.	1,000	1871	all day	....	6	...	....	"	1	65	150	150	125	6	6	4	6 w	8 w
Renfrew	E. N. Jory	I.	825	1891	"	..	7	....	....	"	1	52	150	150	125	8	7	4	6 w	6 w
Richmond	R. J. Brown	I.	600	1898	"	1	2	....	....	"	1	42	150	500	30	3	3	7	7 w	7 w
St. Thomas	N. M. Campbell	I.	1,000	1876	"	....	8	....	....	"	1	50	150	150	180	8	8	3	5 w	6 w
Sarnia	A. Wark.	I.	950	1867	"	...	9	....	...	.....	1	52	150	150	65	9	9	2	6 w	6 w
Simcoe	I. S. Rowat	I.	800	1889	"	1	7	..	....	all day	1	75	150	150	105	8	8	3	7 w	8 w
Stratford	J. R. Stuart	I.	1,000	1887	"	...	21	4	....	.....	1	55	150	150	145	25	22	3	6 w	6 w
Strathroy	T. Dunsmore	I.	850	1882	"	....	8	....	....	all day	1	56	150	150	50	9	8	3	6 w	6 w
Toronto	W. E. Groves	I.	1,150	1895	"	2	9	....	3	"	1	189	150	150	190	12	12	15	3 w	6 w
Toronto Junction	W. Wilson	I.	900	1889	"	....	10	....	1	"	1	50	150	150	120	10	10	3	6 w	6 w
Vankleekhill	S. J. Keys	I.	750	1898	"	....	4	...	..	"	1	213	150	300	83	4	4	4	6 w	7 w
Walkerton	E. J. Rowlands	I.	850	1893	"	1	7	1	....	"	1	55	150	150	120	9	9	3	6 w	6 w
Welland	S. C. Woodworth	I.	800	1890	"	2	3	2	...	"	....	300	150	150	95	7	6	3	6 w	7 w
Whitby	J. A. Brown	I.	950	1877	"	3	1	3	...	"	1	79	150	150	35	7	7	2	5 w	6 w
Windsor	G. W. Chisholm	I.	900	1895	"	....	7	1	..	"	....	150	150	150	110	8	8	3	6 w	6 w
Wookstock	S. Nethercott	I.	900	1893	"	...	27	1	1	"	1	115	150	150	70	30	12	2	6 w	8 w
*R. C. S. S. Ottawa	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	....	.....	800	... ..	.. ..	...	.. .	....	... .	....
Total	.....	2M.A. 3B.A. 54 I. 1 II.				70	498	83	23			60-- 5,030	10,750	12,074	5,909					

*French Training School.

APPENDIX H.

Name of Model School.	During how many weeks do students teach in the divisions?	How many hours per day?	Total number of classes in the divisions used for Model School purposes.	Average number of lessons taught by each student during the term.	Average number of lessons each class will be taught by all the students during the term.	Average length of each lesson.	How long does a student remain in a division before passing to another?	Number of students on roll.	Male.	Female.	Number who passed final examination.			Number with senior leaving certificate.	Number with junior.	Number with primary.	Number with district.	Allowance made by trustees to principal's assistant.	Number of renewals granted by the board.	Average age of students.
											Male.	Female.	Total.					$		
Athens	6 w	2	11	20	45	20 m	4 d	25	7	18	7	18	25	....	13	12	....	120	5	19
Barrie	6 w	30 m	20	20	14	20 m	4 d	20	6	14	6	12	18	1	9	10	....	....	3	20
Beamsville	6 w	1½	11	20	36	20 m	6 d	20	7	13	6	12	18	....	12	8	....	125	12	19
Berlin	6 w	1¼	18	24	17	25 m	4 d	10	5	5	5	5	10	....	6	4	....	150	14	19½
Bracebridge	6 w	2	16	20	19	15 m	2 d	17	6	11	6	5	11	....	3	5	9	150	1	18
Bradford	6 w	3	10	20	30	20 m	1 w	15	8	7	8	7	15	....	4	9	2	125	....	19
Brampton	6 w	1½	20	30	22	20 m	3 d	17	6	11	5	11	16	1	7	9	....	....	3	19¼
Brantford	6 w	2	21	26	10	30 m	2 d	7	2	5	....	....	....	2	4	1	....		4	18
Caledonia	6 w	2¾	8	15	50	20 m	1 w	27	15	12	15	12	27	....	18	9	....	125	11	19½
Chatham	4 w	1¼	22	20	40	20 m	2 d	43	11	32	10	31	41	3	25	15	....	175	38	18½
Clinton	5 w	1	18	20	18	20 m	3 d	29	15	14	15	14	29	....	16	13	....	125	17	19½
Cobourg	6 w	½ ay	30	25	15	30 m	2 d	18	11	7	9	4	13	1	5	12	....	140	....	19½
Collingwood	4 w	1½	21	17	8	20 m	1 w	10	8	2	8	2	10	....	3	7	....	130	....	20
Cornwall	6 w	1	20	18	20	20 m	1 w	22	5	17	5	17	22	....	10	12	....	150	14	19
Durham	4 w	1½	13	18	29	20 m	3 d	21	6	15	6	14	20	1	6	14	....	125	13	19
Elora	6 w	1¼	14	11	18	18 m	3 d	23	11	12	8	11	19	1	11	11	....	125	16	13½
Forest	6 w	1½	17	18	23	20 m	1 w	28	11	17	10	13	23	....	15	13	....	125	....	19½
Galt	4 w	1¾	15	21	17	20 m	1 d	13	6	7	6	6	12	....	8	5	....	150	....	19
Gananoque	6½ w	1¾	14	20	17	20 m	1 w	12	5	7	5	7	12	....	5	7	....	150	2	18½
Hamilton	6 w	1½	22	24	26	20 m	4 d	25	13	12	12	10	22	....	8	17	....	150	6	19½
Goderich	8 w	1	....	20	8	25 m	1 w	24	10	14	9	12	21	3	17	4	....	....	16	20½
Ingersoll	5 w	1¼	14	25	8	22 m	4 d	6	3	3	3	3	6	....	6	....	....	50	14	19
Kincardine	7 w	1½	18	18	17	25 m	3 d	17	6	11	5	9	14	1	9	7	....	....	10	19
Kingston	8½ w	⅝	42	18	13	20 m	9 d	36	12	24	12	24	36	4	10	13	13	99	10	18¾
Lindsay	7 w	1	43	20	16	25 m	2 d	36	11	25	9	23	32	....	12	24	..	....	10	19¼
London	6 w	1¾	15	20	47	20 m	2 d	34	9	25	9	25	34	3	21	10	....	250	1	19½
Madoc	7 w	1½	15	13	29	15 m	5 d	35	12	23	12	23	35	....	13	19	3	140	15	19
Meaford	3 w	1½	13	20	15	25 m	1 d	16	8	8	....	....	....	1	7	8	....	100	9	19
Milton	6 w	1½	17	18	27	20 m	1 w	26	9	17	7	17	24	3	12	9	2	150	4	19½

Minden	6 w	1¼	10	17	17	20 m	1 w	10	...	10	....	10	10	....	....	....	10	88	12	18½
Mitchell	2 w	40 m	9	21	23	20 m	4 d	10	2	8	2	8	10	1	7	2	....	125	5	18⅔
Mt. Forest	6 w	1¼	19	18	3	20 m	2 d	28	11	17	9	14	23	...	12	16	....	140	4	19
Morrisburg	7 w	1½	15	16	16	22 m	1 w	35	17	18	17	18	35	1	8	26	....	150	...	19
Napanee	5 w	1	17	20	23	20 m	3 d	20	9	11	8	11	19	1	6	12	1	200	11	19
Newmarket	5 w	1	6	25	25	20 m	2 d	12	5	7	5	7	12	1	9	2	....	150	16	19½
Norwood	5 w	1½	12	18	27	24 m	4 d	18	11	7	11	7	18	3	7	8	....	130	4	19
Orangeville	6 w	40 m	16	24	25	20 m	4 d	17	10	7	10	6	16	1	5	11	...	115	7	19
Owen Sound	4 w	1h15m	18	18	26	25 m	2 d	26	8	18	6	18	24	...	9	17	...	..	2	19
Parry Sound	4 w	3.6	12	21	33	20 m	1 d	19	8	11	8	11	19	....	..	1	18	125	17	20
Perth	6 w	1h20m	18	20	38	20 m	1 w	34	7	27	5	25	30	...	17	17	....	125	7	19
Picton	6 w	1½	16	18	19	20 m	3 d	23	9	14	7	12	19	....	7	16	....	135	14	19
*Plantagenet	4 w	3	8	6	13	30 m	2 d	18	8	10	6	7	13	....	9	9	....	....	....	19
Port Hope	5½ w	1	16	20	18	20 m	5 d	15	6	9	6	7	13	1	9	5	....	....	18	19
Port Perry	6 w	1	14	20	21	20 m	4 d	15	7	8	7	8	15	....	6	9	..	125	12	20
Prescott	4 w	1⅓	12	30	15	20 m	3 d	25	9	16	9	16	25	4	9	12	....	150	8	18½
Renfrew	7 w	1¼	14	16	28	20 m	1 w	25	6	19	6	19	25	....	6	12	7	125	13	18⅘
Richmond	6 w	3	8	18	47	20 m	7 d	28	8	20	8	20	28	...	8	20	....	198	2	19
St. Thomas	6 w	1	8	27	54	20 m	2 d	16	10	6	9	6	15	2	8	6	....	....	25	19
Sarnia	7 w	1¼	24	26	16	20 m	3 d	15	6	9	6	8	14	1	7	7	....	....	..	19
Simcoe	4 w	1½	11	20	38	20 m	2 d	21	15	6	5	14	19	1	5	15	....	160	12	19¼
Stratford	6 w	1½	43	24	19	20 m	1 w	33	11	22	8	19	27	5	14	14	....	....	11	18⅔
Strathroy	6 w	1½	22	25	12	25 m	3 d	10	3	7	3	7	10	1	7	2	....	175	10	20½
Toronto	6 w	40 m	12	18	30	20 m	1 d	39	38	1	.	37	37	2	32	5	....	240	21	19½
Toronto Junction	6 w	1	14	18	30	20 m	3 d	24	6	18	5	18	23	1	13	10	....	150	....	19
Vankleekhill	5 w	3	12	16	20	15 m	4 d	17	3	14	13	3	16	...	5	12	...	130	5	19
Walkerton	7 w	2½	19	18	22	20 m	4 d	24	15	9	15	6	21	1	13	10	...	130	22	18½
Welland	5 w	1¼	16	20	23	20 m	4 d	19	12	7	6	12	18	3	8	8	....	140	...	19
Whitby	6 w	1½	16	28	12	20 m	1 w	7	2	5	2	5	7	4	3	...	....	120	2	19⅓
Windsor	7 w	1	12	25	50	20 m	1 w	22	8	14	6	12	18	1	7	10	4	160	12	18½
Woodstock	5 w	1½	20	20	20	35 m	5 d	14	6	8	6	8	14	3	8	3	....	....	11	19
Total	.....	.....	.....	.....	.....	.....	.....	1,271	520	751	432	726	1,158	....	....	....	....	....	..	19

* French Training School. † Per month.

APPENDIX I.—*CERTIFICATES, ETC.*

1. Inspectors' Certificates Issued in 1899.

Armstrong, William Gilnochie, M.A.; Andrews, Robert T.

Burchill, John.

Carefoot, George Andrew; Carstairs, John Stewart, B.A.

Edwards, Cephas H., B.A.

Field, John Mordan, B.A.

Hinch, Nicholas Edward. B.A,

Johnston, John Kenneth, M.A.

Kirkconnell, Thomas A., B.A.

Lee, Samuel Carson, B.A.

Marty, Aletta Elise, M.A; Marty, Sophie, E., M.A.; Moshier, David Dingman, B.A.; Morgan, Sydney Albert, B.A., B. Pæd.

Odell, John William, B.A.; Orton, Alvin.

Robertson, Alexander Morton, M.A.; Reynolds, Aaron Kilbourn.

Spence, John Campbell; Shortell, David H., M.A.; Staples, Louis Edgar, M.A.

Tremeer, James, B.A.; Taylor, John Andrew, B.A.; Tasker, Lawrence Herman, B.A.

Wagar, Gardiner Lincoln, B. A.; Williams, H. Sophia; Weidenhammer, William B, B A.

2. High School Principals' Certificates, 1899.

Ackerman Effie Maria, B A.

Burgess, Herbert H., B.A.; Brown, Lyman, B.A.

Clarke, Fred Hall, B.A; Cosens, Absalom, B.A.; Cæsar, Lawson, B.A.; Cameron, Aldis W., B.A.; Coutts, Rich. David, B.A.

Duff, James, M.A.

Farquharson, Robt. Andrew, B.A.; Furlong, Thomas Henry, M.A.; Field, John Mordan, B.A.

Garratt, Mina, B.A.

Hardie, William, B.A.; Haviland, Hugh Johnston, B.A.; Horton, Charles W., B.A.; Hogg, John L, B.A,; Howell, William B., B.A.; Hendrick, Archer Wilmot, B.A.

Johnston, John Kenneth, M.A.; Jones, Geo. Mallory, B.A.

Ivey, Thomas Joyce, M.A.

Liddy, William R., B.A.; Lee, Samuel Carson, B.A.; Lingwood, Fred H., B.A.

MacLean, Allan Edmund, B.A.; McCaig, James, B.A.; McVicar, Archibald, B.A.; MacPherson, Walter Ernest, B.A.; McGee, Cyril Houghton, B.A.; McKim, William Andrew, B. A.; Moshier, David Dingman, B. A.; Mabee, Geo. Elliott, B. A.; Morrow, John D., B.A.

Nelson, John, B.A,

Pugsley, Edmund, B.A.

Robertson, Alex. Morton, M.A.

Stothers, Robert, B.A.; Seaton, Edward T., B.A.

P. 138] PUBLIC SCHOOL, WELLINGTON STREET, ST. THOMAS.

Thompson, Peter James, B A.; Taylor, Julian J. W., B.A.; Tasker, Lawrence Herman, B.A.

Witheril, Ebenezer Rufus, B. A.; Whyte, Robert, B. A.; Weidenhammer, William B., B.A.

3. High School Assistants' Certificates, 1899.

Bryan, Hugh Wallace, M.A. ; Bragg, Thos. Geo., B.A.

Clarke, Harry J. ; Carefoot, Geo. Andrew ; Cathro, Elizabeth Don.

De Beauregard, Esther, B.A.; Dent, William Arthur ; Dandy, William Percy, B.A.

Graham, William Andrew, B.A. ; Galbraith, Robert, B.A.

Harding, Nina May, B.A. ; Higginson, Maria Adelaide.

Ivey, Thomas Joyce, M.A.

Lavell, Cecil F., M.A.

MacKellar, Herbert Sutherland, B.A. : McQueen, James M. ; McFayden,, Donald, B.A. ; McCutcheon, Fred. W. C., B.A.; Mowbray, William, B.A. ; Marty, Sophie E., M.A. ; Morgan, Harriet Emma ; Mitchell, John Worth.

Neilson, James.

O'Brien, Elizabeth.

Reid, Minerva E. ; Rowsome, Alice Gertrude, B.A.

Sutherland, Mary H., B.A. : Silverthorne, William Leslie, B.A.

Thompson, John Fletcher, B.A.

Van Every, John Fair, B.A.

Weir, Annie, B.A.

4. Number of Public School Teachers' Certificates, 1899.

	Male.	Female.	Total.
Third Class, per County Model School reports	432	726	1 158
Second Class—			
From Ottawa Normal School	56	160	216
Toronto Normal School	36	226	262
First Class—			
From Ontario Normal College	43	20	63

5. List of Provincial Certificates Granted by the Education Department, 1899.

Candidate's Name.	Grade. First Class.	Grade. Second Class.	Candidate's Name.	Grade. First Class.	Grade. Second Class.
Austin, Ida	....	1	Berry, Zannie	....	1
*Adams, Susie Jessie	....	1	Binns, Alice	....	1
Anderson, Ernest Albert	....	1	Bixby, Margaret Lilian	..	1
Atkinson, Ella	....	1	Blaisdell, Reginald B	....	1
Adair, Jean	1	....	Blanchard, James Elwood	..	1
Ahner, Gertrude K	....	1	Blondin, Aggie Mary	....	1
Armstrong, Silas Henry	....	1	Burnett, Jennie	....	1
Atkinson, Albert Edwin	....	1	Bywater, Mary Gertrude	....	1
*Auld, Nettie	....	1	Bryant, John L	1	....
*Austin, Oliver D	....	1	Beckett, Samuel E. J	1	....
Abbott, Lillian Blanche	....	1	Blain, Maude E	1	....
Alguire, Agnes Ethyle	....	1	Callon, Lilly E	...	1
Allan, Elsie	....	1	Cameron, E. Kate	....	1
Anderson, Susan	....	1	*Capling, Rosetta	....	1
*Arnott, Stephen James	....	1	Carlton, Jessie	....	1
Asseltine, Flora B	....	1	Carr, Harrison	....	1
Bishop, Charles P	1	....	Chellew, Lettie Jessie	....	1
Bannerman, May Lucile	....	1	Colborne, Marie Delphine	....	1
*Barker, Jessie Jean	....	1	*†Colles, Ida St. Clare	....	1
Bethune, Dolena Isabella	....	1	Colvin, Maggie	....	1
Binnie, Laura R	....	1	Coppinger, Mamie	....	1
Black, Walter A	....	1	*Cross, Laura Louise	....	1
Bogle, Mary Graham	....	1	*Cunningham, Alice	....	1
Brett, Amy W	....	1	Cunningham, Hugh	....	1
*Brock, Maud L	....	1	Currie, Grace	....	1
Burt, Agnes	....	1	Currie, M. Florence	....	1
*Baird, Kate	....	1	Campbell, Flora May	....	1
Bunney, James William	....	1	Carter, John	....	1
Bate, Mary Lee	....	1	Coleman, Clementina	....	1
Beatty, Etta Elviea	....	1	Collison, David Leonard	....	1
*Bickle, Ada Marie	....	1	Colquhoun, Jean A	....	1
Birch, Mabel Lilian	....	1	Cooper, Eva	....	1
Burt, Florence	....	1	*Courtney, Eleanor	....	1
Breakell, Etta Ross	....	1	Creary, Archy Greer	....	1
Breckenridge, Robert Stuart	....	1	Charters, Wallace Werrett	1	....
Brownlee, Kate Agnes	....	1	Callaway, Selena Ann	....	1
Briggs, Laura H	....	1	Campbell, Bessie F	....	1
Beckett, Agnes M	1	....	Carnaghan, Annie	....	1
Bennett, Mabel	1	....	Carroll, Marione Bertha	....	1
Bielby, George	1	....	Cassels, William Blake	....	1
Barker, George Albert	1	....	Catherwood, Robert Andrew	....	1
Bennett, John S	1	....	Chrysler, Florence Evelyn	....	1
Bradley, William M	1	....	Clark, Anna S	....	1
Burchell, John	1	....	Clarke, Helen Maud	....	1
*Balls, Martha Elena	....	1	*Cummings, Lizzie	....	1
Bates, Mary Isa	....	1	*Cutler, Elsie O	....	1
*Beattie, Maud M	....	1	Campbell, Addie Baxter	....	1
Bell, Annie	....	1	Carson, Whitfield Robert	....	1
Bell, Alice F	....	1	Casey, Mary	....	1
Birch, Florence S	....	1	Clarke, Alice Elizabeth	....	1
Brand, Maud V	....	1	Clarke, Etta	....	1
Bagnall, Minnie Jane	....	1	Coons, Laura Edith	....	1
Baker, Martelle	....	1	Craig, Emma	1	....
Barron, Frederick	....	1	Darby, Isabella L. H	....	1
Bartley, Annie	....	1	Devereux, Nellie	....	1
*Beattie, Maggie Ellen	....	1	Dickson, Zilpha H	....	1

*Honors. †Medallist.

List of Provincial Certificates.

Candidate's Name.	Grade. First Class	Grade. Second Class.	Candidate's Name.	Grade. First Class.	Grade. Second Class.
Draper, Gertrude Louise	....	1	Grange, Minnie	....	1
Dewar, Maggie	....	1	Green, Kathleen Maud	....	1
Devlin, Christine Isabel	....	1	Greer, Florence Mabel	....	1
Dougan, Harry Leslie	....	1	Gummer, Minnie	....	1
Doherty, Mabel	1	....	Gillesby, Joseph R	1	....
Duff, Catherine Isobel	1	....	Glaspel, Hugh Allan	1	....
Dobbie, John Albert	1	....	Gordon, John G	1	....
Dowkes, William J	1	....	Galey, Florence Maude	....	1
Dowsley, William C	1	....	Gibson, Millard John	....	1
Dobbie, Isabella E	1	....	Glynn, Mabel Grace	....	1
Davis, Margaret	....	1	Gray, Lilian D	....	1
*Draper, Jane Edith	....	1	*Greer, Nan	....	1
Disher, Maggie A	....	1	Gardiner, George Hamilton	....	1
Davey, Lily Elizabeth Mary	....	1	*Gibson, Margaret Isabel	....	1
*Davy, Lena May	....	1	Graham, Wm. Edgar	....	1
Dewar, Lizzie Agnes	....	1	Hill, Etta Maude	1	....
Duprau, Charles Robert	....	1	Hamilton, Belle	....	1
*Elder, Ethel Belle	....	1	Harrison, Mattie E	....	1
Elliott, Jessie	....	1	Hays, Agnes Dickson	....	1
Elliott, Eliza Goldie	....	1	*Heddle, Maggie	....	1
Elliott, Robert G	1	....	*Hesketh, Hattie May	....	1
Everest, John William	....	1	*Hill, Mabel	....	1
Eamon, Mary Edith	....	1	*Hobson, Ida	....	1
Edgar, A. Maye	....	1	Hollis, C. Mabel	....	1
Exelby, Nellie	....	1	Huggins, Maggie	....	1
Ewing, Albert Freeman, B.A.	1	....	Heritage, Susanna F	....	1
Faull, John Bennett	....	1	Howson, Christopher	....	1
*Fenton, Charles H	....	1	Hunter, Elizabeth Grace	....	1
*Frank, Margaret	....	1	Hutcheon, Jennie Clare	....	1
Fraser, Evelyn E	....	1	Hardie, Sarah Ann	1	....
*Fraser, Mary E	....	1	Hiltz, William Wesley	1	....
Fittal, George Edward	....	1	Hinch, Nicholas Edward	1	....
Fleming, William Stuart	....	1	Holmes, Charles Williams	1	....
Forrester, David	1	....	Halley, Louise	....	1
Farr, Edgar Walter	....	1	Hambley, Laura H	....	1
Ford, Mary Ellen	....	1	Heaslip, Louise	....	1
*Fair, Henry Edgarton	....	1	Hendry, Edith Florence	....	1
Fleming, Robert Dunsmore	....	1	Henry, Florence	....	1
Fleury, Thomas Joseph	....	1	Hill, Minnie E	....	1
Foley, Mrs. Ellen Jane	....	1	Holland, Helen	....	1
Foley, Minnie	....	1	Holt, Clara May	....	1
Garbutt, Frederick George	1	....	*Howe, Ella Maria	....	1
Gilmour, John	....	1	Hunter, Ida Maud	....	1
Gissing, Millicent	....	1	*Hutchinson, Annie Edith	....	1
*Gubbins, Stella A	....	1	Hagle, Ellen Annette	....	1
*Gallagher, Isabella Jane	....	1	Hawkins, Laura Ethel	....	1
Gardener, Rena Maye	....	1	Hayes, Fanny	....	1
Gibson, John Elias	....	1	Heanin, Sara Ann	....	1
Gilbert, Blanche Henrietta	....	1	Hickey, Mary Catherine	....	1
Gillespie, Annie Maud M	....	1	Holliston, William	....	1
Goff, Charles J	....	1	Hunter, Emma	....	1
Gorman, Margaret	....	1	Hicks, David, B. A	1	....
Goswell, Hattie Mae	....	1	Irvine, Robert Gordon	1	....
Graham, Birdie Edith	....	1	Ionson Maggie Allen	1	....
Graham, Gertrude	....	1	Irwin, Ethel Mary	....	1

*Honors.

List of Provincial Certificates.

Candidate's Name.	Grade. First Class.	Grade. Second Class.
Irwin, Mabel Emma	....	1
Irwin, Sara Jemima	....	1
*Johnston, Margaret	....	1
Johnston, Minnie	....	1
James, Fannie Elizabeth	....	1
Johnson, Helen Phila	....	1
Jewitt Thomas John	1	....
*Jamieson, Jessie Louisa	....	1
Jenner, Lydia A	....	1
Johnston, Marjorie	1	....
*Kerr, William M	....	1
Kilpatrick, Helen Marion	....	1
Ketcheson, Harry Wilmot	....	1
Kirley, Mary Helen	....	1
Keith, Jean Elizabeth	....	1
Kelly, Alberta	....	1
Kennedy, Margaret Emily	....	1
*Kirkwood, James	....	1
Knowles, Katie R	....	1
Kennedy, Edna Louise	....	1
Kidwell, Mary Grace	....	1
*Kinahan, John	....	1
Lane, Mary Emily	....	1
Lawrence, Sarah A	....	1
Lean, Francis Maud	....	1
Leppard, Charles E	...	1
Long. Lillian	....	1
Lougheed, Emma	....	1
Lousley, Kate M	....	1
Louthwood, Mildred M	....	1
*Lane, Robert Taryswell	....	1
Leddy, John	....	1
Lehmann, Albert Edward	....	1
Longmore, Lola	....	1
Langford, Thomas Eli	1	....
Logie, David M	1	....
Lackner, Emma	....	1
†Laidlaw, Beatrice Smith	....	1
Langdon, Goldwin Smith	....	1
Leavens, Hiram Kenyon	....	1
Lee, Carrie Jane	....	1
Lewis, Lizzie	....	1
Lewis, Frederic Birthal	....	1
*Little, Alice A	....	1
Legate, Mary Fletcher	....	1
Livingstone, Jennie	....	1
Loucks, Minnie A	....	1
MacFarlane, Maud	....	1
Mackey, Mary C	....	1
MacLaren, Maggie M	....	1
Macalpine, William W	....	1
Macartney, William Craven	....	1
MacKay, Dolena	....	1
MacDonald, Neil S	1	....
Macdonald, Hugh	....	1
MacBryan, Ella	....	1
MacGregor, Euphemia Stuart	....	1
MacIntyre, Maggie Ann	....	1
MacKay, Althea Maude	....	1
MacKellar, Annie Edith	....	1
*MacDonald, Jessie Campbell	....	1
MacIntyre, Jessie A	....	1
McDiarmid, John H	1	....
*McFayden	....	1
McArthur, Janet Ethelwyn	....	1
McCornock, Margaret W	....	1
*McHaney, Margaret Alexia	....	1
McLauchlin, Lizzie J	....	1
*McNaughton, Clara Edith	....	1
McPherson, Lizzie	....	1
McTavish, Rosa	....	1
McWilliams, Emily	....	1
*McColl, Helen Blanche	....	1
*McCutchen, John M	....	1
McDermid, Anna	....	1
McDermid, Jennie	....	1
McDiarmid, Bella Brown	....	1
McElroy, Thomas Verney Craig	....	1
McGowan, James	....	1
McIntosh, Coleman	....	1
*McKenny, Margaret	....	1
McKenzie, Jessie Ellen	....	1
McKillop Annie	....	1
McKinnon, Annie	....	1
McLean, Marie C	....	1
McLellan, Teresa Jennet	....	1
McDonald, Ernest Augustus	....	1
McCaudless, Florence M	....	1
McColl, Marion Louise	....	1
McColl, Laura Adeline	....	1
McDougall, Margaret Ann	....	1
*McFayden, Stephen	....	1
McGriman, Ella	....	1
*McIsaac, Margaret	....	1
McLachlan, Daniel Alexander	....	1
McMurphy, Peter J	....	1
McNab, Maggie C	....	1
McQueen, Sadie Catharine	....	1
McConnell, R. A. Allan	..	1
McDermott, Mary Amelia	....	1
McDonald, Jessie Elizabeth	....	1
McDonald. Kate	....	1
McEwen, Mary Eliza	....	1
McFadden, Isabel	....	1
McGregor, Elizabeth	....	1
McGuire, Mary Alice	....	1
McKanna, Maude	....	1
*McKay, Faunie Christina	....	1
McKennie, Minnie	....	1
McNaughton, Christie Anne	...	1

*Honors. †Medallist.

List of Provincial Certificates.

Candidate's Name.	Grade. First Class.	Grade. Second Class.	Candidate's Name.	Grade. First Class.	Grade. Second Class.
Metcalf, Ethel Mary	....	1	*Plummer, Leila Theodosia	....	1
Millar, Katie	....	1	Porter, Maude E.	....	1
*Mitchell, Adah Frances	....	1	Prendergast, Annie	....	1
Mitchell, Lizzie	....	1	Patterson, Ellen May	....	1
Morrison, Georgia A	....	1	Penton, Maria Field	....	1
Morrison, Minnie	....	1	*Perry, Walter Byron	....	1
*Morton, Louise	....	1	Platt, Edward Orren	1	....
Mullins, Mary Helen	....	1	Peake, Maude M	....	1
Munro, Annie	....	1	Penno, Emma	....	1
Munro, Mary Perry	....	1	Powley, Ada	....	1
*Murdie, Isabella	....	1	Parkinson, Isabella	....	1
Mains, Minnnie	....	1	Patton, Rose	....	1
Mark, Emma Mariabella	....	1	*Pettigrew, Lillian May	....	1
Middleton, Joseph Edward	....	1	Reed, Thomas Emerson, B.A.	1	....
Millar, Laura Sisk	....	1	*Rix, Mary Jane	....	1
Mills, Agnes Withrow	....	1	*Roberts, Ethel Belle	....	1
Milne, Linda	....	1	Ross, Mary Euphemia	....	1
Moffat, Frank Beamer	....	1	Rendell, Abigail Louise	....	1
Moran, John	....	1	Rooney, Lilian Theresa	....	1
Morrison, Kate C.	....	1	Rosbrook, Susan Jane	....	1
Marshall, John Wells	1	....	Rowe, Helena	....	1
Menger, William O.	1	....	Rowe, Mary Agnes	....	1
Morrison, A. Selkirk	1	....	Robertson, Jessie Morse	1	....
Morrison, Minnie L.	1	....	Rason, May	....	1
Meehan, Margaret	....	1	Reaman, Dessa	....	1
Marlton, Elma	....	1	*Robb, Mary	....	1
Meen, Kate Louise	....	1	Rous, Helen A	....	1
Moffat, Maude	....	1	Ratz, Edward E	....	1
*Morris, Bertha	....	1	Richardson, Sarah	....	1
Munn, Bessie	....	1	Robinson, Arthur William	....	1
Major, Jennie Catharine	....	1	Rogers, Arthur Howard	....	1
Mills, Annie Rebecca	....	1	Rutley, Altha Ann	....	1
Moore, Minnie	....	1	*Ryan, Annie	....	1
*Moore, George Albert	....	1	Rogers, William Henry	1	....
Neilly, Lila	....	1	Shaw, Louise	1	....
Newton, Annie E.	....	1	Scanlon, Josie M	....	1
Nokes, Maude	....	1	Scott, Birdie Esther	....	1
Neilson, Stella	....	1	Sheppard, Mossie B.	....	1
Nicholls, Katie	....	1	Simpson, Robert	....	1
Nichols, Emma A.	....	1	Sissons, Maggie	....	1
Nicol, Margaret	....	1	Small, Annie May	....	1
*O'Connor, Agnes Patricia	....	1	Spence, Robert M.	....	1
O'Leary, Mary	....	1	*Steiner, Florence Bertha	....	1
O'Neill, Joseph	....	1	*Steward, Ida	....	1
O'Connor, Kathleen W.	1	....	Stovel, Grace	....	1
O'Hara, Kate Mary	....	1	Sutherland, Annie	....	1
O'Toole, Rose M.	....	1	Saunders, Ida	....	1
Orr, Mabel Grace	....	1	Sayers, Thomas Albert	....	1
Ogilvie, Elsie Sutherland	....	1	Sharman, Sarah Mabel	....	1
Oke, Herbert James	....	1	Smitheram, Maggie	....	1
Packham, Clara	....	1	Snider, Emily May	....	1
Pardoe, Ellen Edith	....	1	*Snider, Frederick Irvine	....	1
Parker, Florence Alberta	....	1	Sprung, Christina A	....	
Pattullo, James A.	....	1	Stalker, Margaret	....	
Perry, Margaret Frances	....	1	Stewart, Effie Jane	....	

*Honors.

List of Provincial Certificates.

Candidate's Name.	Grade. First Class.	Grade. Second Class.
Scarr, Tena	1	....
Skelton, Margaret	1	....
Smith, George Frederick	1	....
Staples, Louis Edgar	1	....
Stewart, William Henry	1	....
Shortell, David H	1	....
Scrutton, Emilly	....	1
Sharpe, Lucas	....	1
Shaw, Lizzie Galloway	....	1
Sheppard, Annie M	....	1
*Smith, Maggie	....	1
Smith, Mary Jane	....	1
*Spence, Mrs. Carrie Reid	....	1
Stapleton, Agnes	....	1
Stewart, James	....	1
Stonehouse, Edith J.	....	1
Sutherland, Minnie Corlis	....	1
Swick, Rachael Amelia	....	1
Seabrook, Hattie	....	1
Shaver, Catharine Angeline	....	1
Simpson, Eva May	....	1
Snedden, Maggie Christina	....	1
Southon, William	....	1
Stevens, Florence	....	1
Stevenson, Robert Bruce	....	1
Sullivan, Kate	....	1
Tanton, Francis	1	....
Tait, Maggie	....	1
*Tennant, Annie Isabel	....	1
Thompson, Gertrude	....	1
Thomson, Mary	....	1
Thorburn, William	....	1
Treadgold, Elizabeth Jane	....	1
*Trebel, Mabel	....	1
*Tweddle, Annie Julia	....	1
Taylor, Isabelle	....	1
Thompson, Ethel	....	1
Teskey, Lily	1	....
Thompson, Annie	....	1
Thomson, Ada M	....	1
*Thomson, Olive Mabel	....	1
Thornton, Charlotte Lucille	....	1
Trenouth, William J	....	1
Tweedie, Agnes	....	1
†*Taylor, Flora Margaret	....	1
*Tebutt, Charles Albert	....	1
Thompson, Lettie May	....	1
Thompson, Bessie	....	1
Toohey, William Antonelli	....	1
Vandervoort, Frances M	...	1
Vankleek, Martha Watson	....	1
*Wadsworth, Fanny Edith	....	1
Walden, Minnie	....	1
Wallace, Ella May	....	1
*Walton, Irene Maud	....	1
Walton, Hannah Maria	....	1
Webster, Lois	....	1
*Wellinger, Ethel Winnifred	....	1
Whillans, Elizabeth	....	1
*Whittingham, Bertha	....	1
Wilcox, Mabel Mildred	....	1
*Wilson, Rachael E. A	....	1
Workman, Bessie	....	1
Wallace, Mary Ettie	....	1
Wardrobe, Harriet Maud	....	1
*Waters, Anna Marie	....	1
*Weir, David	....	1
Wilkie, Amelia Barbara	....	1
*Williams, Mabel Anna	....	1
Willoughby, Bertha Adealia	....	1
Woods, Phœbe	....	1
Wright, Lillian Elizabeth	....	1
Watt, Robert Emerson	1	....
White, Robena	1	....
Wyatt, Edward	1	....
Walker, Arthur J	1	....
Walker, Alice May	....	1
Ward, Frederick M. B.	....	1
Ward, Lelia M.	....	1
Washington, Stella	....	1
Waterman, Ethel Cordella	....	1
*Waugh. Annie Findlay	....	1
Weir, Gertrude Catherine	....	1
*Wellwood, Lizzie	....	1
Wesley, Carrie	....	1
Wesley, Kathleen	....	1
*Wessels, Ernest Albert	....	1
Williams, Amy	....	1
Williamson, Alma May	....	1
Winnett, Eva A	....	1
*Ward, Bessie	....	1
Warren, Bertha Melissa	....	1
Watt, Nerissa Ella	....	1
*Wingard, Mabel	....	1
*Young, Helenora Anna	....	....
Yeo, Charles Timothy	....	1
Young, Annie	....	1

*Honors. †Medallist.

6. Kindergarten Certificates, 1899.

Directors.

*Aylesworth, Victoria
Bastedo, Marion.
*Carrie, Rachel.
Carroll, Elma.
Holden, Letitia.
*Keys, Ethel G. M.
Leighton, Ida.
Leighton, Alverda J.
Linden, Janet.
Lucas, Mary.
McIntosh, Lillian J.
Mills, E. Gertrude.
Moore, Etta.
*Perry, Mary.
*Rodger, Frances.
*Rorke, Sadie.
Smith, Lottie.
*Smith, Maude.
Thompson, Beatrice.
Wilson, Persis.
*Winter, Myrtle.

Assistants.

Ashton, Blanche.
Abbott, Ida A.
Acheson, Annie L. M.
Bignell, Florence.
Baxter, Lou.
Bradshaw, Olive.
*Courtney, Edith A
Casson, Margaret Alice.
Cronyn, Muriel.
Cassidy, Dolares.
Coates, Emma L
Copeland, Annie.
*Cozzens, C. Helene.
Davidson, Annie.
Dalby, Ethel M.
Davis, Mabel.
Davids, Hilda I.
Evans, Ella A.
Fisher, Nora.
Fuller, Alice Maude.
Greene, Evelyn M.
Grant, Alice.
*Hotson, A. Maude.
Harding, Mabel.
*Jamieson, Isabel C
*Jones, Edith A.
Love, Mabel.
Lanskail, Agnes M.
Laidlaw, Maude.
McConnell, Lulu E.
McAuley, Adelaide.
Mackie, Emma L.
Martin, May E.
Manly, Laura E. M.
Mansell, Florence A.
Murray, Nettie Craig.
Nudel, Louisa,
Northcott, Edith.
Purser, Eliza Matilda.
Perkins, Ethel.
Philips, Florence.
Randall, Minnie.
Ready, Evelyn.
*Rattray, Margie.
Reikie, Helen.
Robinson. Violet.
Robson, Ella.
Sherwood, Mrs. Charlotte A.
Sullivan, Mary Frances.
Small, Alma.
Stagg, Grace E.
*Thompson, Annie L.
Threlkeld, Fannie D.
*Wilcox, Caroline.
Whitton, Jennie.
Woods, Lexie Hodge.
Whiteside, Katie E.
Wells, Mabel.
Wenborne, Ida E.
Wilson, Edith.
Wilson, Irene.

7. Domestic Science Certificates.

No examination held in 1899.

*Honors.

8. Temporary and Extended Certificates Issued During 1899.

Counties.	Temporary certificates authorized by the Minister of Education during the year.	Third Class certificates extended by the Minister of Education during the year.
Essex	10	6
Frontenac	4	..
Kent	..	1
Lanark	1	1
Leeds	..	1
Norfolk	2	..
Ontario	.	2
Oxford	..	1
Peel	1	..
Prescott and Russell	1	..
Prince Edward	..	1
Renfrew	3	4
Stormont	..	2
Welland	.	1
District of Parry Sound and Nipissing	11	2
Eastern Ontario, R.C.S.S.	20	4
Western Ontario, R.C.S.S.	5	..
Total, 1899	58	26
Total, 1898	47	22
Increase	9	4

The periods of service were : three years and under, 6 ; seven years and over, 20.

APPENDIX K—*INDUSTRIAL SCHOOLS, 1899.*

Hon. R. Harcourt, M. A., Q. C., Minister of Education, Toronto

Dear Sir,—I send the following report regarding the Industrial Schools—the Victoria Industrial School for Boys at Mimico, and the Alexandra Industrial School for Girls at Scarboro :—

1. *Victoria Industrial School.*

The total attendance for the year was 47,529 days.
The total number registered for the year was 186.
69 boys were in attendance during the entire year.
55 were sent out during the year, and 62 came in.
The attendance at present is 132 boys.

The boys are employed as follows :—

Farm	27
Carpenter shop	17
Tailor shop	19
Shoe shop	17
Laundry	8
Kitchen	8
Dining-room	15
Knitting-room	6
Printing	15
Engine-room	7
Conservatories	9
Cottages	22
Bake-room	3
Office	2
School all day	11

The school is most efficiently managed by Mr. Ferrier, and he has an able and faithful staff of assistants.

2. Alexandra Industrial School.

The total attendance for the year was 9,177 days.

The total number registered was 36.

10 were in attendance during the entire year.

13 were sent out during the year and 13 came in.

The attendance at present is 25 girls.

The girls are taught to knit and sew, and to work in the kitchen, the laundry, and to do general household work.

The institution is beautifully situated and is efficiently managed.

Yours truly

JAMES L. HUGHES

TORONTO, December, 1899.

APPENDIX L.—*DEPARTMENTAL LIBRARY, 1899.*

Report of the Librarian of the Education Department.

To the Honorable Richard Harcourt, M. A., Q. C. Minister of Education for Ontario.

The following is my report of the operation of the Library of this Department for the year 1899.

The ordinary business of the Library of the Department consists—

1. In the giving out of Books on Education, and other subjects, which form the subjects of instruction in the Normal and Model Schools, directly connected with the Department here in Toronto. These books are given out to students of the Normal School and to teachers and other persons, in terms of the official regulations relating to the library. A record of each book given out is made in a Register, in which the parties borrowing books sign their names, by way of a receipt and as a guarantee that they will return the books in a given time.

2. The selection, in special cases, and the purchase of books is under the authority of the Minister. Each book is stamped as it is received, and a record of it made in an entry book.

3. The binding of books, periodicals and leading newspapers.

4. Preparation of catalogues, and the noting in them of new purchase of books.

5. Miscellaneous matters, including the examination and certifying of bills and accounts.

1. Record of Books given out during 1892-1899.

The following table shows a falling off in the number of books given out in 1898, and 1899. This was chiefly owing to the removal of the School of Pedagogy to the Normal College at Hamilton.

	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
Given out in month of January..	159	334	375	354	573	699	608	484
" " February.	431	764	609	804	1,040	1,370	928	868
" " March ...	617	944	585	1,034	1,270	1,702	1,393	1,159
" " April.....	467	897	991	627	1,021	1,111	882	848
" " May.....	546	814	694	633	843	923	969	895
" " June.....	332	461	332	354	400	609	677	518
" " July.....	69	54	47	223	32	254	265	256
" " August...	100	97	48	100	16	184	233	329
" " September	526	370	344	415	295	514	410	489
" " October ..	1,263	1,148	1,010	1,130	1,170	1,200	1,043	1,018
" " November	1,136	1,004	1,039	1,063	1,268	1,099	1,024	1,034
" " December	693	559	540	597	752	704	464	549
	6,339	7,446	6,614	7,334	8,680	10,369	8,896	8,447

2. Number of Books purchased in 1892-1899.

The number of books purchased in	1892	was	388
" "	1893	"	290
" "	1894	"	257
" "	1895	"	430
" "	1896	"	495
" "	1897	"	476
" "	1898	"	533
" "	1899	"	315

3. Number of Books Donated.

The number of books—chiefly Text Books sent as donation or gift to the Library in 1898 was 49; in 1899, 74.

4. Number of Magazines and other periodicals received at the Library in 1898 was 182; in 1899, 179.

4.—Books, Magazines, etc., bound during the years 1892-1899.

1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
79	109	136	141	98	99	90	94

5.—Official Report on Education in Different Countries received during 1896, 1897, 1898 and 1899.

——	1896.	1897.	1898.	1899.
From Great Britain and Ireland	28	36	16	28
Various Provinces of the Dominion	29	64	61	53
Australasia:				
Victoria	2	1		1
New South Wales		1	1	1
South Australia				1
Western Australia	1	1	4	1
Queensland	1	1	1	
Tasmania	1	2	1	1
New Zealand	13	2	1	14
Other British possessions:				
Mauritius	1			
Cape of Good Hope	1	1	1	1
Natal	1			
Jamaica	2	2	1	1
Barbados		1		
British Guiana	1	1	1	1
Various States of the American Union	36	47	53	81
Miscellaneous:				
Buenos Ayres	10		10	12
Montevideo	11		6	8
Costa Rica	5	1	2	3
France	3	8	1	21
Germany			1	5
Portugal				1
Switzerland		3		2
Japan	1	1	1	2
Hawaii			1	
Argentine Republic		13	2	
Venezuela	1			
Uruguay		13		
Totals	148	199	165	238

6.—Various Catalogues—Printed and Unprinted.

1. *Education.*—The catalogue of Books relating to various subjects of Education and kindred subjects for the use of Students, Teachers and others has been reprinted. The present catalogue is a reprint, with large additions, of a catalogue of a more contracted character, printed in 1886.

2. *History of Canada.*—A supplement of the catalogue of our very extensive variety of books on the Dominion of Canada and its various Provinces, printed in 1890, is now being prepared for issue this year. The various historical societies avail themselves of this collection of historical books—the members of which express themselves greatly pleased with the extent and variety of books in the collection.

3. *Miscellaneous.*—As stated in my report of 1896, we have Catalogues in manuscript of (1) books on the classics and kindred subjects, (2) of works of art, and (3) of a number of rare text books, dictionaries, etc., presented to the library by the Venerable Dr. Scadding, ex-master of Upper Canada College.

4. I would again recommend that the revised Catalogue of Books on the various Provinces of the Dominion be reprinted. At present, reference has to be made to the old Catalogue of 1890—since then we have very nearly doubled the number of Books on this most interesting subject—many of them, and especially of the new collection, of rare value. Of this older collection not less than fifty-four volumes were printed before the beginning of the nineteenth century. The Canadian part of the Library is rich in poetry written by persons in the Dominion of Canada.

7.—Various Kinds of Books in the Departmental Library.

The following is a general statement of the kind of Books in the Departmental Library, viz. :

Canadian History.
British History.
American Colonial History.
United States' History.
Greek and Roman History.
The Fine Arts, and Books on Design.
National Reports on Education.
Law Reports and Treatises.
Canadian Parliamentary Reports and Papers.
Colleges and Various Superior Schools in Ontario.
Teaching in Theory and Practice.
Reference Books (various).
Bound Periodicals and Newspapers.
French Books (various).
Works on Geography, including Atlases.
Natural Science.
Pedagogy and Science of Education.
Miscellaneous Books.

8.—Historiography.

During this year I have completed the Sixth Volume of the Documentary History of Education in Upper Canada, bringing the record down to the end of the year 1846.

The educational incidents of this year (1846,) are especially interesting, from the fact that they relate to the laying of "educational foundations" in Upper Canada.

As this Documentary History is not as available to the general public, as is this Report of the Minister of Education, it may be interesting to quote from the "Prefatory Remarks of the Editor" of the Sixth Volume of the Documentary History the following statement, showing what were the extent and character of the "educational foundations" laid in 1846 and here referred to :—

"This Volume deals chiefly with the subject of 'first things' in connection with our System of Public Education and of 'laying foundations' . . .

"The 'first things' referred to, as part of these 'foundations' of 1846, were the following :—

"1. The publication of an extended Report on a Projected System of Popular Education for Upper Canada.

"2. The preparation and passing of a Common School Bill, founded upon that Report, and the first School Bill prepared under the auspices of Doctor Ryerson.

"3. The appointment of a Board of Education for Upper Canada.

"4. The selection of a Series of School Text Books, which remained in use in the Common Schools for twenty-two years, and until 1868.

"5. The organization of the Education Department under the School Act of 1846.

"6. The Establishment of a Provincial Normal School—(formally opened in 1847).

"7. The substitution of District School Superintendents for Local Township Superintendents.

"8. General Forms and Regulations for the Government of Common Schools, including provision for giving Religious Instruction in these Schools, under the School Act of 1846."

. . . . . .

As to those who may see copies of this Documentary History, the following reference to the labor of preparing that work may be of interest:

"A word, in conclusion, as to the work involved in the preparation of this and kindred Volumes:—

"This Sixth Volume, as may be seen from the foregoing rapid Survey of its contents, embraces a great variety of most interesting educational matters. Its preparation —as did those of the preceding Volumes—involves months of labour, and a good deal of correspondence, in collecting, from all sources of information available, such papers and documents, relating to Education in Upper Canada, as are of general and public interest,—abridging unnecessary details, as well as condensing, or omitting, others. It also implies the classifying and arranging, chronologically, the topics treated, and putting them into Chapters—and these Chapters include, at least, one thousand pages of "printer's copy." It has also to be so edited, that obvious errors, in names and dates, do not appear. Corrections have also to be constantly made in Grammar and Orthography,—supplying omissions, expanding eliptical expressions, making clear obscure and uncertain statements and dealing specifically with conflicting alleged 'matters of fact.' Fortunately I have had a personal knowledge of most of the matters treated of in these Volumes, and that greatly lightens the labor of the Editor.

"It is gratifying to find, that, although the labor of compiling these Volumes is arduous, yet the Work itself is highly appreciated by the Educational Representatives of the United States. In Chapter IV on 'Education in Canada,' in the advance sheets of the forthcoming Report of the United States Commissioner of Education, kindly sent to me as I had finished this sixth Volume, the Honorable Doctor Harris, Commissioner, says:—

"The history of the organized System of Public Education in Ontario may be said to date from the passage of the Upper Canada School Law of 1843. The practical establishment of the System was the work of Doctor Egerton Ryerson, who was appointed Chief Superintendent of Education soon after the passage of that Law. The services, which he rendered,—his catholic spirit, his administrative force, his untiring devotion to the cause, have long since commanded universal acknowledgment.

"The Province has been equally fortunate in the Historian of the System, Doctor John George Hodgins, who was associated with Doctor Ryerson in the Education Office from 1844, and has maintained official relations with it to the present moment.

"Doctor Hodgins . . . has enjoyed ample facilities for the work, with which he now crowns the service of more than half a century, namely the 'Documentary History of Education in Upper Canada,' from the passing of the Canada Constitutional Act of 1791, to a very recent date. This work, of which Five Volumes are completed . . . is invaluable to all students of its social and political development, and equally valuable to all students of Educational History:

"It is particularly interesting to American readers to trace, in this record, the influence, from our own (original) Colonies and States, upon the Educational policies of the Province.

"But, if Ontario owes much to the example of the United States, it offers us most instructive lessons, with respect to many questions of educational policy and organization." . . .

I cannot speak too highly of the valuable services of Miss Crooks, who so admirably discharges the duties of Assistant Librarian. Her accurate knowledge of Books and current Literature, and her methodical exactness in matters of detail have relieved me of a good deal of responsibility,—especially as I have to give a considerable amount of time in order to obtain the necessary accurate information in regard to papers and documents for the Documentary History, on which I am engaged.

In all of these matters, Mr. Evans has proved himself to be a most excellent assistant in the Library.

At present I am preparing the Seventh Volume of the Documentary History. It promises to be one of the most complete and interesting Volumes of the Series, as I have been able to gather in very ample materials. It will detail at length the efforts made to settle the University Question by the Honorable (afterwards Sir) John A. Macdonald. It will also give particulars of the cause of failure for the fourth time, (1843-1847) to settle this then troublesome question.

J. GEORGE HODGINS,

Librarian and Historiographer to the Education Department for Ontario.

APPENDIX M.—*TECHNICAL EDUCATION—PUBLIC AND FREE LIBRARIES, ART SCHOOLS, LITERARY AND SCIENTIFIC INSTITUTIONS, &c.*

REPORT OF S. P. MAY, ESQ., M.D., C.L.H., SUPERINTENDENT OF PUBLIC LIBRARIES, ART SCHOOLS, ETC.

1. *Public Libraries.*

SIR,—I have the honor to submit herewith my report on the Public and Free Libraries, Art Schools, and Scientific Institutions receiving a share of the Government Grant, in the Province of Ontario, for the year ending 30th of April, 1899.

At the present time there are 421 Public and Free Libraries, Art Schools, Scientific Institutions, etc. receiving Government aid, in operation in this Province.

For the year ending 30th April, 1899, the following institutions reported:

Public Libraries	247
Free Libraries	117
Art Schools, etc.	7
Scientific Institutions, etc.	8
New Libraries and others which did not report before December, 1899	42
Total	421

The following Public Libraries did not report: Ailsa Craig, Athens, Bothwell, Brougham, Chalk River, Coboconk, Courtright, Delaware, Emsdale, Haileybury, Hastings, Highgate, Hillsburg, Horning's Mills, Kimberley, Linwood, Lion's Head, Logan (Mitchell P. O.), Lucille, Mayflower (Wiarton P. O.), Mono College (Orangeville P.O.), Morewood, New Sarum, Richard's Landing, Ripley, St. Vincent (Oxmead P. O.), Sudbury, Trenton, Tweed, Wabigoon, Walter's Falls.

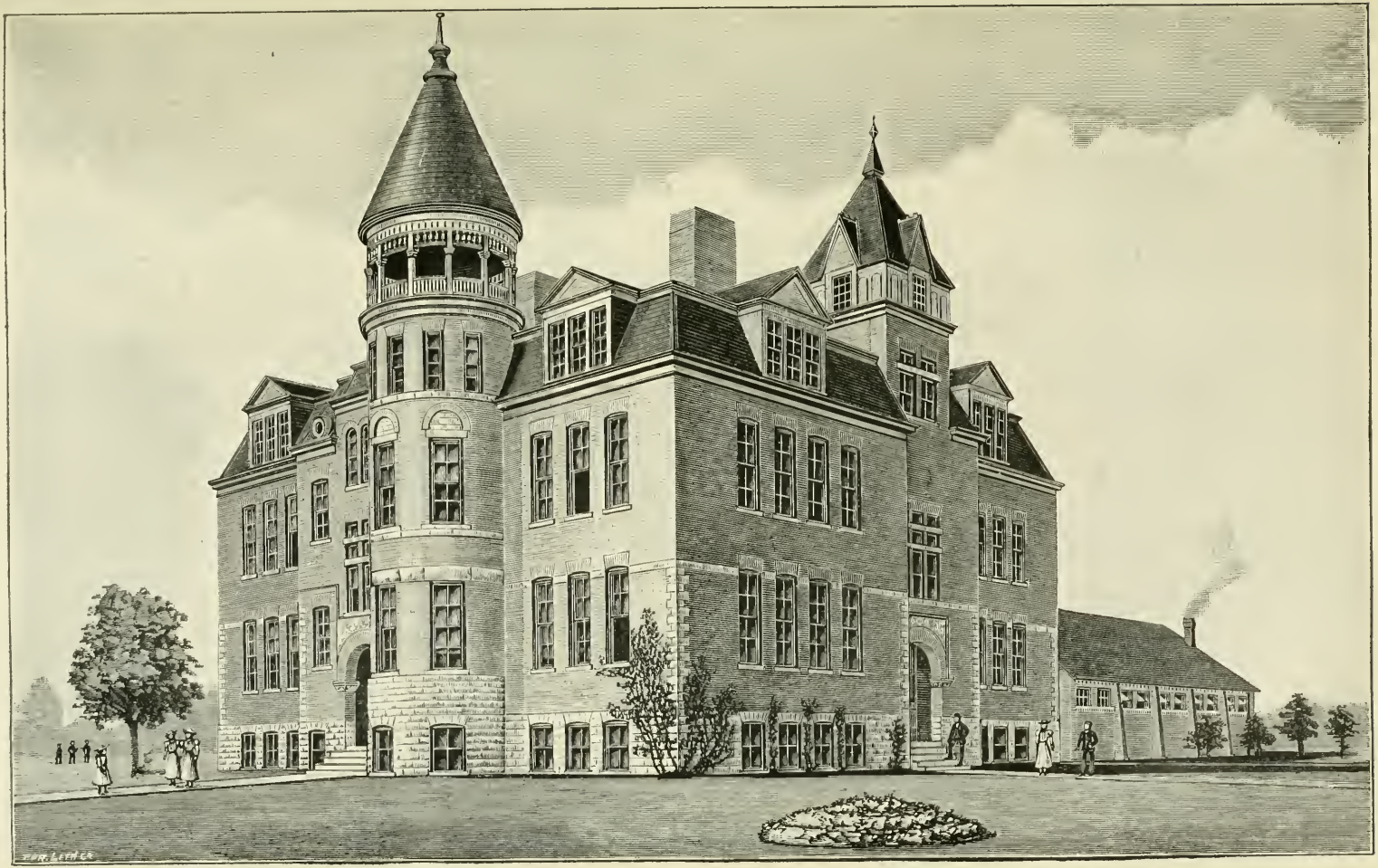
The following Public Libraries have been incorporated since the 30th of April, 1899: Ancaster, Binbrook, Bishop's Mills, Dawson, Hawkesville, Kemble, Marksville, Metcalfe, Vankleekhill, Wellesley.

I inspected the following Public and Free Libraries, Art Schools, Literary and Scientific Institutions, etc., during the year: Atwood, Beamsville, Belleville, Bracondale, Bridgeburg, Caledonia, Cargill, Chesley, Deseronto, Dundas, Fort Erie, Garden Island Grantham (St. Catharines P. O.), Grimsby, Hamilton Free Library, Hamilton Art School, Hanover, Harrington, Kingston Art School, Kingston Free Library, Listowel, Lynden, London Art School, London Free Library, Markham, Merritton, Milverton, Napanee, Niagara Falls, Oakville, Odessa, Ottawa Literary and Scientific Society, Ottawa French Canadian Institute, Ottawa Field Naturalist Club, Ottawa St. Patrick's Association, Palmerston, Paisley, Pakenham, Paris, Port Hope, Princeton, Scarboro, Stratford, St. Catharines, St. Mary's, St. George, St. Thomas Art School, St. Thomas Public Library, Trenton, Thorold, Unionville, Victoria (Caledonia P. O.), Walkerton, York.

The following table shows the locality of every Public Library in the Province

PUBLIC LIBRARIES IN 1898-9.

Counties and Districts.	Cities, Towns and Villages.
Addington	Camden, East.
"	Enterprise.
"	Napanee Mills.
"	Newburgh.
"	Odessa.
"	Tamworth.
Algoma	Chapleau.
"	Manitowaning.
"	Marksville.
"	Port Arthur.
"	Rat Portage.
"	Richard's Landing.
"	Sault Ste. Marie.
"	Schreiber.
"	Sudbury.
"	Thessalon.
"	Webbwood.
Brant	Brantford.
"	Burford.
"	Glenmorris.
"	Paris.
"	Scotland.
"	St. George.
Bruce	Bervie.
"	Cargill.
"	Chesley.
"	Hepworth.
"	Holyrood.
"	Kincardine.
"	Lion's Head.
"	Lucknow.
"	Mildmay.
"	Paisley.
"	Pinkerton.
"	Port Elgin.
"	Ripley.
"	Riversdale.
"	Southampton.
"	Teeswater.
"	Tara.
"	Tiverton.
"	Underwood.
"	Walkerton.
"	Westford.
"	Wiarton.
Carleton	Carp.
"	Dawson.
"	Kars.
"	Kinburn.
"	Manotick.
"	Metcalfe.
"	North Gower.
"	Richmond.
Dufferin	Horning's Mills.
"	Lucille.
Dufferin	Melancthon.
"	Mono Centre.
"	Mono College.
"	Orangeville.
"	Primrose.
"	Rosemont.
"	Shelburne.
"	Violet Hill.
Dundas	Chesterville.
"	Dundela.
"	Inkerman.
"	Iroquois.
"	Morewood.
"	Morrisburg.
"	Winchester.
Durham	Bowmanville.
"	Millbrook.
"	Orono.
"	Port Hope.
Elgin	Aylmer.
"	Bayham.
"	Dutton.
"	New Sarum.
"	Port Stanley.
"	Rodney.
"	St Thomas.
"	Shedden.
"	Sparta.
"	Springfield.
"	West Lorne.
Essex	Comber.
"	Essex.
"	Harrow.
"	Kingsville.
"	Leamington.
"	Pelee Island.
"	Windsor.
Frontenac	Garden Island.
"	Kingston.
"	Mississippi.
Glengarry	Lancaster.
"	Maxville.
"	Williamstown.
Grenville	Algonquin.
"	Bishop's Mills.
"	Cardinal.
"	Easton's Corners.
"	Merrickville.
"	North Augusta.
"	Oxford Mills.
"	Prescott.
"	Spencerville.
Grey	Bognor.
"	Chatsworth.
"	Clarksburg.



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Public Libraries.

Counties and Districts.	Cities, Towns and Villages.
Grey	Durham.
"	Dundalk.
"	Flesherton.
"	Holland Centre.
"	Kemble.
"	Kimberley.
"	Hanover.
"	Markdale.
"	Meaford.
"	Owen Sound.
"	Shallow Lake.
"	St. Vincent.
"	Thornbury.
"	Walter's Falls.
Haliburton	Minden.
Haldimand	Caledonia.
"	Cayuga.
"	Cheapside.
"	Dufferin.
"	Dunnville.
"	Hagarsville.
"	Jarvis.
"	Nanticoke.
"	Victoria.
"	York.
Halton	Acton.
"	Burlington.
"	Georgetown.
"	Milton.
"	Oakville.
Hastings	Belleville.
"	Deseronto.
"	Trenton.
"	Tweed.
Huron	Auburn.
"	Blyth.
"	Brussels.
"	Clinton.
"	Dungannon.
"	Ethel.
"	Exeter.
"	Fordwich.
"	Goderich.
"	Gorrie.
"	Hensall.
"	Seaforth.
"	St. Helen's.
"	Wingham.
"	Wroxeter.
Kent	Blenheim.
"	Bothwell.
"	Chatham.
"	Dresden.
"	Duart.
"	Highgate.
"	Tilbury.
"	Tilbury, E.
Kent	Ridgetown.
"	Romney.
"	Thamesville.
"	Wallaceburg.
"	Wheatley.
Lambton	Arkona.
"	Aberarder.
"	Alvinston.
"	Copleston.
"	Courtwright.
"	Forest.
"	Mayflower, Watford P.O.
"	Oil Springs.
"	Point Edward.
"	Thedford.
"	Watford.
"	Wyoming.
Lanark	Allan's Mills.
"	Almonte.
"	Carleton Place.
"	Dalhousie.
"	Lanark.
"	Pakenham.
"	Perth.
"	Smith's Falls.
Leeds	Athens.
"	Brockville.
"	Gananoque.
"	Mallorytown.
Lennox	Napanee.
Lincoln	Beamsville.
"	Grantham.
"	Merritton.
"	Grimsby.
"	Niagara.
"	St. Catharines.
Manitoulin I.	Gore Bay.
"	Little Current.
Middlesex	Ailsa Craig.
"	Belmont.
"	Coldstream.
"	Delaware.
"	Dorchester.
"	Glencoe.
"	London.
"	Lucan.
"	Melbourne.
"	Parkhill.
"	Strathroy.
"	Wardsville.
Muskoka	Bracebridge.
"	Burk's Falls.
"	Gravenhurst.
"	Huntsville.
"	Port Carling.
Nipissing	Copper Cliff.
"	Haileybury.

PUBLIC LIBRARIES.

Counties and Districts.	Cities, Towns and Villages.
Nipissing	North Bay.
"	Thornloe.
Norfolk	Delhi.
"	Port Rowan.
"	Simcoe.
"	Waterford.
Northumberland	Brighton.
"	Campbellford.
"	Cobourg.
"	Cold Springs.
"	Colborne.
"	Fenella.
"	Gore's Landing.
"	Hastings.
"	Warkworth.
Ontario	Beaverton.
"	Brooklin.
"	Brougham.
"	Cannington.
"	Claremont
"	Oshawa.
"	Pickering.
"	Port Perry.
"	Sunderland.
"	Uxbridge.
"	Whitby.
"	Zephyr.
Oxford	Embro.
"	Harrington.
"	Ingersoll.
"	Kintore
"	Plattsville.
"	Norwich.
"	Otterville.
"	Princeton.
"	Tavistock.
"	Tilsonburg.
"	Thamesford.
"	Woodstock.
Parry Sound	Emsdale.
"	Kearney.
"	Parry Sound.
"	South River.
"	Sundridge.
"	Trout Creek.
Peel	Alton.
"	Belfountain.
"	Bolton.
"	Brampton.
"	Caledon.
"	Cheltenham.
"	Claude.
"	Forks of the Credit.
"	Inglewood.
"	Mono Road.
"	Mono Mills.
"	Port Credit.
"	Streetsville.
Perth	Atwood.
Perth	Listowel.
"	Logan.
"	Milverton.
"	Mitchell.
"	Monkton.
"	Shakespeare.
"	St. Mary's.
"	Stratford.
Peterborough	Lakefield.
"	Norwood.
"	Peterborough.
Prescott	Vankleekhill.
Prince Edward	Bloomfield.
"	Picton.
Rainy River	Dryden.
"	Fort Francis.
"	Wabigoon.
Renfrew	Admaston.
"	Arnprior.
"	Burnstown
"	Calabogie.
"	Chalk River.
"	Douglas.
"	Pembroke.
"	Renfrew.
"	White Lake.
Russell	Russell.
"	Vars.
Stormont	Cornwall.
Simcoe	Alliston.
"	Angus.
"	Barrie.
"	Beeton.
"	Bradford.
"	Coldwater.
"	Collingwood.
"	Cookstown.
"	Creemore.
"	Elmvale.
"	Midland.
"	Orillia.
"	Penetanguishene.
"	Stayner,
"	Tottenham.
Victoria	Bobcaygeon.
"	Cambray.
"	Coboconk.
"	Fenelon Falls.
"	Kinmount.
"	Kirkfield.
"	Little Britain.
"	Lindsay.
"	Manilla.
"	Oakwood.
"	Omemee.
"	Woodville.
Waterloo	Ayr.
"	Baden.
"	Berlin.

PUBLIC LIBRARIES.

Counties and Districts.	Cities, Towns and Villages.	Counties and Districts.	Cities, Towns and Villages.
Waterloo	Elmira.	Wellington	Hillsburg.
"	Floradale.	"	Morriston.
"	Galt.	"	Mount Forest.
"	Hawkesville.	"	Palmerston.
"	Hespeler.	"	Rockwood.
"	Linwood.	Wentworth	Ancaster.
"	New Hamburg.	"	Binbrook.
"	Preston.	"	Dundas.
"	Waterloo.	"	Hamilton.
"	Wellesley.	"	Lynden.
Welland	Bridgeburg.	"	Waterdown.
"	Fonthill.	York	Aurora.
"	Fort Erie.	"	Bracondale.
"	Niagara Falls.	"	Don.
"	Niagara Falls South.	"	Highland Creek.
"	Port Colborne.	"	Islington.
"	Ridgeway.	"	King.
"	Thorold.	"	Maple.
"	Welland.	"	Markham.
Wellington	Alma.	"	Mount Albert.
"	Arthur.	"	Newmarket.
"	Bellwood.	"	Queensville.
"	Clifford.	"	Richmond Hill.
"	Drayton.	"	Scarborough.
"	Elora.	"	Stouffville.
"	Erin.	"	Thornhill.
"	Ennotville.	"	Toronto.
"	Fergus.	"	Toronto Junction.
"	Glen Allen.	"	Unionville.
"	Grand Valley.	"	Vandorf.
"	Guelph.	"	Weston.
"	Harriston.	"	Woodbridge.

The above list may be classified as follows :

Public Libraries reporting	247
Free Libraries reporting	117
Public Libraries not reporting	29
Free Libraries not reporting	13
Public Libraries incorporated since 30th April, 1899	10
	406

I. PUBLIC LIBRARIES (NOT FREE).

The following extracts are taken from the annual reports for the year ending 30th April, 1899. (For details see tables A and B):

1. *Classification of Public Libraries Reporting 1898-99.*

Public Libraries, with libraries, reading rooms, and evening classes	2
" " " " and reading rooms	128
" " " " only	117
Total	247

2. *Public Libraries—Receipts and Balances on hand.*

The total receipts of Public Libraries was	$75,875 36
Balances on hand	5,969 83

3. *Public Libraries—Expenditure.*

The total expenditure of 247 Public Libraries was	$69,905 53

4. *Public Libraries—Assets and Liabilities.*

Assets of 247 Public Libraries	$358,395 72
Liabilities of 247 Public Libraries	16,021 00

5. *Number of Members in Public Libraries.*

247 Public Libraries have 32,249 members.

6. *Number of Volumes in Public Libraries and Number of Volumes Issued.*

Number of volumes in 247 Libraries	436,124
Number of volumes issued in 247 Libraries	734,642

7. *Reading Rooms in Public Libraries.*

128 Libraries reporting have reading rooms.
128 Libraries subscribed for 2,717 newspapers and periodicals.

8. *Evening Classes in Public Libraries.*

2 Libraries had 35 pupils in the drawing courses.

TABLE A.—Receipts and Expenditure, Assets and Liabilities, etc., of the Public Libraries for the year ending 30th April, 1899.

Public Libraries.	Receipts.	Expenditures.	Balances on hand.	Number of members	Number of volumes in Libraries.	Number of volumes issued.	No. of newspapers and periodicals.	Number of pupils in evening classes.	Assets.	Liabilities.
	$ c.	$ c.	$ c.						$ c.	$ c.
1 Aberardar	492 20	492 20	.....	104	2,901	3,323	25	....	1,616 00	149 05
2 Admaston	144 90	122 66	22 24	145	961	902	.....	....	443 24	.....
3 Allan's Mills	54 74	54 70	04	58	363	587	.....	....	300 04	.....
4 Alliston	192 42	185 43	6 99	107	1,585	2,734	.....	....	1,179 79	.....
5 Alma	110 35	103 89	6 46	104	479	958	.....	....	237 75	16 00
6 Almonte	760 89	566 73	194 16	145	2,869	6,530	30	....	2,713 97	.....
7 Arkona	266 05	264 31	1 74	160	1,627	1,859	18	....	901 74	90 00
8 Arthur	154 88	153 71	1 17	122	2,591	2,330	18	....	1,766 17	25 95
9 Atwood	236 93	236 57	36	131	889	6,434	...	..	583 97	114 93
10 Auburn	349 06	339 73	9 33	107	545	1,949	13	....	356 26	100 00
11 Aurora	459 27	455 81	3 46	111	2,526	5,809	.....	....	3,829 59	984 38
12 Baden	264 43	264 43	.....	103	2,402	1,045	16	....	1,384 77	38 95
13 Barrie	763 24	751 15	12 09	298	4,070	9,247	28	....	4,512 09	140 00
14 Bayham	152 45	131 92	20 53	107	303	1,120	.....	....	224 15	.....
15 Beamsville	206 08	206 08	....	184	1,812	3,264	10	....	1,609 32	163 07
16 Beaverton	326 19	326 11	08	125	1.000	2,435	13	....	836 37	23 73
17 Belleville	1,997 40	1,923 08	74 32	157	3,893	9,250	32	....	4,374 32	240 19
18 Belmont	81 61	81 61	....	109	1,021	1,584	... .	....	821 65	.....
19 Belwood	154 60	152 01	2 64	111	765	1,964	.....	....	652 64	30 00
20 Bervie	33 00	18 00	15 00	104	517	1,523	.....	....	325 00	.....
21 Blenheim	781 92	781 46	46	183	2,884	5,264	21	...	2,355 46	165 00
22 Bloomfield	373 19	367 95	5 24	233	1,131	8,759	24	...	855 08	66 45
23 Blyth	115 18	115 18	.....	104	1,345	591	21	..	606 00	7 43
24 Bobcaygeon	447 58	213 89	233 69	117	2,053	2,814	16	...	1,840 76	.....
25 Bagnor	151 09	108 49	42 60	104	1,249	3,194	.....	....	869 93	.....
26 Bolton	281 89	281 89	.. ....	141	2,351	7,501	20	....	1,644 49	.....
27 Bowmanville	548 60	548 60	.....	182	2,891	5,376	41	....	2,965 00	48 02
28 Bracebridge	437 94	379 19	58 75	155	2,374	4,918	25	....	2,333 75	11 64
29 Bracondale	122 86	117 28	5 58	103	147	486	.....	....	99 38	.....
30 Bradford	354 54	310 17	44 37	106	1,781	2,978	.....	....	1,331 27	127 24
31 Bridgeburg	153 80	111 98	41 82	153	293	694	.....	....	193 80	.....
32 Brooklin	244 21	232 98	11 23	141	1,132	2,486	.....	....	585 42	75 15
33 Burford	478 01	477 35	66	121	1,141	2,989	19	....	805 43	37 00
34 Burlington	346 97	274 31	72 66	113	1,514	3,210	6	....	1,372 66	106 00
35 Burnstown	83 20	83 20	....	109	450	768	.....	....	205 00	15 00
36 Calabogie	4 05	.....	4 05	10	248	127	.....	....	136 08	....
37 Cambray	220 14	200 02	20 12	100	305	361	.....	....	211 57	92 85
38 Campbellford	446 17	427 44	18 73	184	3,557	4,387	22	...	1,843 73	72 50
39 Cannington	342 27	316 63	25 64	114	1,762	5,383	21	....	1,560 64	....
40 Cargill	183 76	180 27	3 49	130	849	2,202	.....	....	515 34	.....
41 Carp	175 71	138 99	36 72	101	717	1,193	.....	....	520 72	.....
42 Chapleau	769 03	622 06	146 97	104	1,408	1,201	29	....	4,476 30	159 27
43 Chatsworth	156 03	138 78	17 25	102	2,178	3,411	.....	....	1,518 34	.....
44 Cheapside	125 98	98 73	27 25	105	1,023	981	.....	....	682 88	.....
45 Cheltenham	218 81	218 45	36	123	2,146	2,418	.....	....	1,833 66	.....
46 Claremont	217 56	199 70	17 86	102	1,850	2,051	.....	....	1,171 40	.....
47 Clarksburg	386 81	379 67	7 14	154	882	2,378	5	....	856 22	26 00
48 Claude	182 45	153 04	29 41	106	2,290	2,139	.....	....	1,704 41	....
49 Clifford	224 84	224 84	.....	160	2,779	1,333	.....	....	938 36	57 39
50 Clinton	526 58	494 48	32 10	146	3,768	3,726	25	....	4,014 10	....
51 Cobourg	764 63	754 02	10 61	192	2,702	7,716	30	....	1,360 61	126 00
52 Colborne	163 85	137 48	26 37	108	1,946	2,402	18	....	761 37	35 00
53 Cold Springs	68 10	63 33	4 77	114	856	715	.....	....	736 53	90 99
54 Coldstream	212 64	211 89	75	120	1,144	2,462	22	....	525 75	....
55 Coldwater	352 85	351 20	1 65	133	828	2,326	20	....	524 75	80 00
56 Comber	431 61	307 79	123 82	101	986	2,184	21	....	748 82	.....
57 Cookstown	205 00	200 00	5 00	107	441	2,001	.....	....	405 00	100 00
58 Copleston	125 73	117 79	7 94	119	421	298	.....	....	257 94	46 71
59 Copper Cliff	207 15	195 00	12 15	101	870	1,572	.....	....	657 15	....
60 Dalhousie (McDonald's Cor's. P.O.)	67 93	60 49	7 44	100	310	453	.....	....	217 44	....
61 Don	119 57	94 25	25 32	103	639	634	.....	....	382 51	..... .

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Public Libraries.	Receipts.	Expenditures.	Balances on hand.	Number of members.	Number of volumes in Libraries.	Number of volumes issued.	No. of newspapers and periodicals.	Number of pupils in evening classes.	Assets.	Liabilities.
	$ c.	$ c.	$ c.						$ c.	$ c.
62 Dorchester	233 57	201 19	32 38	106	581	1,404			322 90	
63 Douglas	121 69	120 65	1 04	104	583	1,250			311 04	
64 Dresden	177 49	165 22	12 27	104	871	2,999			553 33	32 50
65 Dryden	330 48	301 87	28 61	103	525	842	12		274 31	171 97
66 Duart	192 82	149 49	43 33	104	1,942	3,842			1,340 99	
67 Dufferin (Clanbrassil P.O.)	137 47	25 00	112 47	77	1,105	865			967 46	
68 Dundalk	311 67	308 51	3 16	180	2,192	4,804			1,503 16	
69 Dundas	848 74	774 31	74 43	190	6,588	5,211	34		5,474 43	13 26
70 Dundela	14 78	14 03	75		156	767			36 25	
71 Dungannon	161 50	143 05	18 45	105	1,260	536	15		661 83	56 05
72 Dunnville	242 40	232 68	9 72	113	2,863	6,043			1,509 72	
73 Durham	413 55	319 73	93 82	120	3,784	4,256	26		3,893 00	
74 Easton Corners	227 83	194 63	33 20	102	769	1,731			532 59	85 05
75 Elmira	220 37	217 52	2 85	108	2,501	2,374	17		1,681 46	
76 Elmvale	268 83	254 30	14 53	101	750	1,038	14		259 23	156 60
77 Elora	487 39	487 39		185	8,596	7,624	20		8,450 00	
78 Embro	339 69	339 69		112	4,315	4,084	20		3,593 58	23 50
79 Ennotville (Barnett P.O.)	163 72	112 60	51 12	103	2,411	602			2,878 73	
80 Essex	525 70	524 51	1 19	125	2,084	2,844	24		2,230 95	25 00
81 Ethel	128 45	128 22	23	120	1,206	1,132			788 11	
82 Fenella	53 51	34 61	18 90	118	453	410			175 67	
83 Fenelon Falls	340 32	322 99	17 33	142	3,215	3,969	33		2,437 26	25 00
84 Fergus	345 99	344 92	1 07	300	4,293	5,639	16		5,432 81	
85 Flesherton	155 98	155 98		110	1,128	1,262	22		580 00	55 79
86 Floradale	158 32	150 39	7 93	110	1,387	1,757	7		724 93	
87 Fonthill	538 42	535 14	3 28	115	2,195	1,661	19		2,068 12	98 00
88 Forks of the Credit	3 25	3 25		50		375			910 25	
89 Fort Erie	130 40	128 64	1 76	105	2,233	2,013			1,365 98	7 00
90 Fort Francis	176 50	174 30	2 20	102	247	957	23		178 77	68 76
91 Galt	914 34	688 51	225 83	348	4,513	12,761	41	21	6,530 83	
92 Gananoque	887 28	633 50	253 78	168	2,395	10,317	23		1,564 38	
93 Glen Allan	131 61	118 70	12 91	102	608	886	1		358 71	
94 Glenmorris	227 20	227 20		101	1,892	1,261	15		1,473 00	3 00
95 Goderich	448 39	443 46	4 93	139	3,520	10,870	24		2,154 93	37 08
96 Gore's Landing	173 03	156 29	16 74	103	222	141			176 74	122 07
97 Grimsby	462 55	407 72	54 83	114	4,797	4,382	20		4,860 53	
98 Harrington	213 94	213 29	65	101	402	801			203 85	70 00
99 Hamilton	1,081 37	1,080 51	86	122	3,871	2,155	25		2,400 86	500 00
100 Harrow	214 63	209 18	5 45	111	543	185			339 30	21 02
101 Hensall	163 28	141 16	22 12	107	1,167	1,101			899 29	
102 Hepworth	139 43	116 34	23 09	103	715	758			396 94	
103 Hespeler	460 23	310 95	149 28	178	2,881	4,398	22		2,679 28	
104 Highland Creek	99 71	91 09	8 62	100	1,409	2,275			1,109 58	
105 Holland Centre	95 75	94 05	1 70	107	677	760			484 37	
106 Holyrood	187 36	183 74	3 62	100	1,583	5,075			1,478 79	60 99
107 Huntsville	412 67	396 99	15 68	101	1,808	6,104	23		1,175 68	7 58
108 Inglewood	133 59	132 88	71	100	1,520	2,803			1,131 71	
109 Inkerman	48 96	48 96		26					48 96	24 96
110 Islington	48 73	44 76	3 97	105	1,102	841			499 65	
111 Jarvis	462 81	452 01	10 80	122	2,872	4,342	21		1,065 80	159 00
112 Kars	185 00	185 00		124	1,244	1,780			638 43	7 74
113 Kearney	60 00	32 00	28 00		314				234 94	199 94
114 Kinburn	140 27	139 90	37	105	980	1,063			540 80	66 86
115 Kincardine	455 63	455 63		201	4,134	11,469	29		3,720 00	247 49
116 King	183 56	180 62	2 94	103	1,228	1,113			607 67	161 00
117 Kingston	1,081 13	832 14	248 99	600	5,962	16,470	40		3,075 00	270 83
118 Kinmount	325 40	313 76	11 64	100	599	1,677			381 60	120 00
119 Kinmore	328 47	318 47	10 00	130	683	900			510 00	215 60
120 Kirkfield	222 66	187 43	35 23	103	1,302	716	15		440 23	87 66
121 Lake Charles	171 66	154 95	16 71	100	1,482	2,291	12		1,028 15	
122 Little Britain	315 98	288 68	27 30	131	1,083	1,789	25		956 25	

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	$ c.	$ c.	$ c.						$ c.	$ c.
123 Lynden	248 74	241 53	7 21	120	885	1,690			425 51	50 00
124 Mallorytown	239 15	186 97	52 18	107	717	2,253			418 93	107 00
125 Manilla	263 63	202 70	60 93	121	1,522	2,418			1,075 87	
126 Manitowaning	127 61	116 24	11 37	120	787	1,562			410 57	124 55
127 Manotick	165 28	132 24	33 04	110	1,438	2,415			934 20	
128 Maple	75 55	74 78	77	195	368	938			234 25	
129 Markdale	520 60	499 39	21 21	171	1,984	4,403	18		1,798 21	
130 Markham	256 29	255 41	88	105	2,701	3,036			2,020 88	65 00
131 Meaford	220 89	208 57	12 32	104	3,455	2,825	15		2,639 32	26 00
132 Melancthon	80 85	79 32	1 53	103	345	1,172			160 06	31 50
133 Melbourne	49 79	49 79		186	705	2,575			475 00	24 49
134 Midland	414 56	408 89	5 67	111	650	2,064	23		655 67	247 00
135 Mildmay	180 01	165 12	14 89	110	983	1,387	14		368 88	65 51
136 Milton	259 53	259 53		262	4,901	3,816	15		4,200 00	21 67
137 Minden	134 82	134 82		140	296	1,560			272 00	18 15
138 Mississippi	120 31	110 05	10 26	42	182	74			112 57	102 31
139 Monkton	215 95	215 95		143	366	229			208 00	103 00
140 Mono Mills	78 78	49 21	29 57	17	575				285 39	
141 Mono Road	42 75	42 75		95	1,880	3,314			1,000 00	
142 Morrisburgh	395 36	395 36		121	2,126	4,150	28		1,240 00	25 43
143 Morriston	178 25	178 25		107	843	1,638			502 92	
144 Mount Albert	198 55	193 50	5 05	157	315	1,875			197 66	79 90
145 Mount Forest	366 59	360 10	6 49	160	2,996	4,250	20		2,579 19	
146 Nanticoke	227 64	211 27	16 37	130	1,115	1,672			807 65	
147 Napanee	498 97	497 76	1 21	204	3,279	7,638	25		1,201 21	258 01
148 Napanee Mills	99 87	95 58	4 29	119	509	1,063			237 45	
149 New Hamburgh	285 03	244 71	40 32	103	1,770	1,780	20		1,325 32	30 00
150 Newmarket	286 16	283 92	2 24	131	1,719	3,446			1,269 32	45 00
151 Niagara	413 82	413 82		121	4,638	5,216	25		4,700 00	
152 Niagara Falls	795 25	620 60	174 65	275	4,796	6,244	25		6,374 25	
153 North Gower	192 59	192 59		102	1,437	2,425			720 00	8 54
154 Norwich	301 09	299 35	1 74	107	3,393	2,954	20		2,366 74	
155 Norwood	204 82	204 82		140	1,764	3,562	16		800 00	8 69
156 Oakville	311 26	310 00	1 36	116	2,968	2,257			2,469 76	45 00
157 Oakwood	285 02	277 18	7 84	122	700	1,873	27		376 53	180 00
158 Odessa	290 09	290 09		150	480	2,609	14		265 55	10 00
159 Omemee	459 20	459 20		139	943	2,392	22		690 14	68 40
160 Orangeville	571 17	531 66	39 51	145	2,810	3,654	27		2,779 51	162 61
161 Orillia	906 82	895 57	11 25	212	3,535	8,939	18		3,953 90	164 60
162 Orono	170 19	162 89	7 30	153	957	2,934			870 78	38 66
163 Owen Sound	556 84	417 91	138 93	226	4,170	13,340	21		5,138 93	12 88
164 Oxford Mills	149 33	144 30	5 03	112	1,131	5,020			815 34	
165 Paisley	480 51	458 63	21 88	250	3,646	5,401	26		4,311 88	31 70
166 Pakenham	153 11	152 83	28	106	402	636	11		265 95	57 00
167 Palmerston	603 52	592 77	10 75	265	1,248	6,058	27		1,060 75	250 00
168 Paris	561 67	561 67		134	6,544	5,915	36		10,959 60	40 26
169 Pelee Island	49 00	49 00		111	187	219			47 50	13 50
170 Pembroke	867 94	787 37	80 57	172	1,583	8,694	18		1,601 97	335 91
171 Perth	425 44	425 00	44	176	3,955	7,089	15		1,900 44	
172 Peterboro'	1,193 14	1,143 83	49 31	368	8,839	15,372	82	14	10,942 73	
173 Pickering	256 22	206 30	49 92	101	1,346	1,991			1,079 92	
174 Picton	537 35	490 35	47 00	200	1,832	5,805	17		972 00	
175 Pinkerton	212 12	211 12	1 00	115	419	575			202 07	109 07
176 Plattsville	205 03	180 80	34 23	100	693	2,789	14		414 23	
177 Point Edward	79 33	75 84	3 49	60	2,465	1,690	9		2,926 49	
178 Port Arthur	334 84	334 84		145	1,285	7,997	28		1,600 00	350 00
179 Port Credit	168 90	159 98	8 92	110	812	1,410			527 25	
180 Port Elgin	199 85	177 55	22 30	102	3,034	2,988	20		1,592 30	
181 Port Hope	820 85	820 85		156	4,134	5,724	35		3,603 00	423 04
182 Port Perry	524 48	506 38	18 10	124	1,495	4,350	16		1,218 10	95 07
183 Port Stanley	209 57	207 36	2 21	104	640	1,311			529 00	
184 Princeton	243 10	220 44	22 66	108	544	1,394			228 11	100 00
185 Preston	628 10	627 63	47	150	5,480	3,858	34		5,480 47	
186 Queensville	185 96	181 13	4 83	120	1,560	3,103			951 83	55 00
187 Rat Portage	723 72	670 48	53 24	103	1,800	3,157	30		1,345 54	464 00

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	$ c.	$ c.	$ c.						$ c.	$ c.
188 Richmond	149 62	145 17	4 45	102	830	1,349	.....	....	507 76	.....
189 Ridgetown	370 75	342 75	28 00	113	3,464	4,182	15	....	4,483 02	57 28
190 Riverdale	96 65	95 22	1 43	113	565	756	.....	....	326 64	.....
191 Rockwood	230 51	215 50	15 01	115	827	2,371	15	....	404 03	.....
192 Rodney	307 52	299 00	8 52	229	551	1,418	21	....	506 68	215 80
193 Romney	267 20	216 28	50 92	135	1,531	1,226	3	....	1,200 03	9 00
194 Rosemont	285 00	257 02	27 98	111	420	1,137	.....	....	266 73	200 00
195 Russell	281 18	272 75	8 43	125	1,085	1,624	26	....	1,516 43	.....
196 Scarboro'	247 53	235 54	11 99	115	4,364	5,128	.....	....	3,246 99	.....
197 Schreiber	428 68	240 32	188 34	112	1,209	4,119	13	....	745 34	99 90
198 Scotland	222 22	216 74	5 48	120	636	2,238	22	....	389 44	.....
199 Seaforth	635 12	611 36	23 76	177	5,102	2,199	18	....	4,334 72	1,000 00
200 SLakespeare	208 00	206 50	1 50	106	343	36	.....	....	206 50	100 00
201 Shallow Lake	385 47	374 82	10 65	102	717	1,336	.....	....	412 27	184 55
202 Sheldon	292 94	284 53	8 41	106	710	1,169	.....	....	386 69	135 00
203 Southampton	232 58	125 43	107 15	130	3,603	3,709	.....	....	3,013 08	.....
204 South River	180 80	180 80	.....	113	390	1,417	.....	....	346 78	.....
205 Sparta	275 07	223 86	51 21	146	1,826	4,263	.....	....	1,416 57	50 00
206 Spencerville	23 00	23 00	.....	123	215	403	.....	....	132 50	.....
207 Strathroy	623 98	623 98	.....	276	4,947	11,895	27	....	4,750 00	49 39
208 Streetsville	383 45	383 45	.....	106	3,124	3,355	18	....	2,600 00	173 64
209 St. George	421 51	421 51	.....	107	4,225	2,496	18	....	4,603 86	.....
210 St. Helen's	225 88	223 98	1 90	103	1,064	1,385	18	....	896 70	40 00
211 Sunderland	328 89	265 91	62 98	103	1,242	1,430	25	....	868 55	.....
212 Tara	270 67	269 51	1 16	108	1,559	1,768	18	....	1,659 30	.....
213 Tavistock	428 03	327 50	100 53	115	2,266	3,692	26	....	1,379 10	.....
214 Teeswater	400 15	371 38	28 77	102	3,064	2,267	22	....	2,078 77	.....
215 Thamesford	198 36	185 80	12 56	152	1,453	2,472	18	....	1,055 72	21 84
216 Thamesville	811 62	810 69	93	131	2,768	3,693	17	....	2,541 11	300 00
217 Thedford	264 27	225 27	39 00	127	1,152	4,367	.....	....	762 00	.....
218 Thornbury	114 76	112 80	1 96	156	765	2,298	.....	....	366 96	39 35
219 Thornhill	165 00	163 79	1 21	124	455	692	12	....	245 39	.....
220 Thornloe	30 25	28 99	1 26	112	75	419	.....	....	30 25	.....
221 Tilbury	368 73	363 23	5 50	111	1,212	1,404	20	....	861 81	100 00
222 Tilbury E., (Valetta P.O.)	74 84	53 00	21 84	103	1,400	2,893	6	....	821 84	.....
223 Tilsonburg	386 15	386 15	.....	200	2,045	5,350	15	....	1,310 00	24 00
224 Tiverton	155 14	154 27	87	103	1,163	4,495	9	....	485 87	.....
225 Toronto Junction	610 68	574 85	35 83	136	2,533	4,885	27	....	2,494 83	170 02
226 Trout Creek	348 79	289 69	59 10	107	474	1,094	.....	....	348 79	201 20
227 Underwood	219 12	198 63	20 49	102	1,630	2,160	.....	....	865 49	.....
228 Unionville	122 72	106 63	16 09	101	142	146	.....	....	118 72	.....
229 Vandorf	188 66	187 73	93	160	1,811	1,371	.....	....	1,450 93	6 77
230 Violet Hill	91 37	90 51	86	113	681	1,768	.....	....	400 86	.....
231 Walkerton	413 37	388 22	25 15	171	2,216	6,820	19	....	1,768 23	100 00
232 Warkworth	274 40	269 00	5 40	108	858	1,318	19	....	540 40	132 50
233 Waterloo	134 13	123 27	10 86	110	1,618	1,478	.....	....	607 55	.....
234 Welland	550 89	478 68	72 21	236	3,143	4,232	24	....	3,841 21	.....
235 West Lorne	304 10	254 10	50 00	205	700	1,645	5	....	500 00	300 00
236 Weston	271 04	271 04	.....	122	2,609	3,227	27	....	2,125 00	7 60
237 Wheatley	235 49	230 65	4 84	120	1,223	2,009	.....	....	764 84	200 84
238 Whitby	252 25	236 66	15 59	115	2,474	4,052	.....	....	1,715 59	33 74
239 Whitchurch	70 21	70 21	.....	105	380	705	.....	....	204 50	25 06
240 Williamstown	56 05	36 25	19 80	100	724	367	.....	....	926 77	75 00
241 Winchester	24 24	24 24	.....	58	631	1,196	.....	....	422 42	24 98
242 Wingham	519 41	431 06	83 35	120	2,696	3,571	44	....	1,978 35	.....
243 Woodbridge	357 99	209 18	148 81	140	1,464	2,345	14	....	1,405 27	249 00
244 Woodstock	782 25	782 25	.....	290	5,149	5,717	48	....	3,500 00	71 63
245 Woodville	351 60	283 90	67 70	100	1,855	2,044	30	....	1,087 70	.....
246 York	210 74	180 08	30 66	121	281	876	.....	....	200 95	155 49
247 Zephyr	263 17	239 97	23 20	118	382	2,291	.....	....	225 66	158 39
	75,875 36	69,905 53	5,969 83	32,249	436,124	734,642	2,717	35	358,395 72	16,021 00

TABLE B.—Evening Classes in Drawing in Public Libraries, 1898-9.

Public Libraries.	Number of Students.	Primary Course.
Galt	9	Practical Geometry.

Public Libraries.	Number of Students.	Primary Course.
Galt	20	Descriptive Geometry, Machine Drawing and Advanced Perspective.
Peterboro'	14	Machine Drawing.
	34	

II. FREE LIBRARIES.

The following extracts are taken from the Annual Reports for the year ending 30th April, 1899, (for details see table C).

1. *Free Libraries' Receipts and Balances on hand.*

The total receipts of 117 Free Libraries was $117,545 84
Balances on hand 8,407 05

2. *Free Libraries' Expenditure.*

The total expenditure of 117 Free Libraries was $109,138 79

3. *Free Libraries' Assets and Liabilities.*

Assets of 117 Free Libraries $577,580 09
Liabilities " 113,902 49

4. *Number of Readers in Free Libraries.*

117 Free Libraries report having had 89,148 readers.

5. *Number of Volumes in Free Libraries, and Number of Volumes Issued.*

Number of volumes in 117 Free Libraries 425,923
Number of volumes issued " 1,812,489

6. *Reading Rooms in Free Libraries.*

72 Free Libraries subscribed for 3,112 newspapers and periodicals.

TABLE C.—Receipts and Expenditures, Assets and Liabilities of Free Libraries for the year ending 30th April, 1899.

Free Libraries.	Receipts.	Expenditures.	Balances on hand.	Number of members.	Number of volumes in Libraries.	Number of volumes issued.	Number of newspapers and periodicals.	Assets.	Liabilities.
	$ c.	$ c.	$ c.					$ c.	$ c.
1 Acton	501 71	490 29	11 42	150	1,285	2,986		1,287 40	210 00
2 Algonquin	160 91	131 45	29 46	117	1,272	1,693		508 17	
3 Alton	246 59	246 59		344	4,609	3,958		3,849 34	18 91
4 Alvinston	664 71	643 71	21 00	210	1,066	3,687	13	721 00	350 00
5 Angus	46 97	44 76	2 21	162	347	2,035		154 74	1 50
6 Arnprior	522 24	516 04	6 20	310	1,765	7,929		1,276 20	88 07
7 Aylmer	475 49	474 73	76	418	3,197	9,560	24	3,100 76	
8 Ayr	191 04	190 53	51	120	3,236	5,643	18	1,600 51	
9 Beeton	337 10	330 72	6 38	142	2,381	2,730	29	1,306 38	40 00
10 Belfountain	118 18	118 18		175	1,677	2,347		1,060 00	
11 Berlin	1,796 35	1,796 35		943	6,774	16,072	51	5,980 00	
12 Brampton	685 13	646 45	38 68	479	3,185	13,344	20	1,939 01	
13 Brantford	3,416 68	3,302 24	114 44	2,425	15,795	70,013	71	13,864 44	
14 Brighton	283 45	275 71	7 74	203	1,462	1,035	24	1,407 64	
15 Brockville	1,469 28	1,334 63	134 65	1,990	8,348	50,772	46	4,384 65	
16 Brussels	425 72	411 23	14 49	282	2,051	3,283	29	1,039 99	60 00
17 Burk's Falls	508 66	485 44	23 22	310	1,080	2,823	22	748 22	
18 Caledon	228 38	183 76	44 62	113	2,303	2,070		1,825 06	
19 Caledonia	249 56	245 56	4 00	148	1,615	3,120		1,029 00	
20 Camden East	193 57	173 07	20 50	166	1,100	2,048	13	668 88	15 00
21 Cardinal	381 08	330 43	50 65	257	1,578	3,151	23	1,175 65	80 00
22 Carleton Place	742 37	686 14	56 23	600	3,255	17,163	16	2,356 23	11 78
23 Cayuga	260 00	260 00		168	828	4,971		620 00	
24 Chatham	2,020 60	1,870 22	150 38	758	3,156	18,794	39	4,425 00	
25 Chesley	406 14	399 42	6 72	233	1,408	3,347	34	756 72	
26 Chesterville	140 20	131 37	8 83	300	526	3,000		411 83	
27 Collingwood	999 44	822 56	176 88	858	5,021	15,416	34	5,584 37	
28 Cornwall	987 49	881 46	106 03	943	2,660	14,446	35	1,813 50	375 00
29 Creemore	139 05	118 28	20 77	220	956	3,068		420 77	
30 Deseronto	902 50	774 35	128 15	802	2,280	24,681	57	2,593 62	
31 Delhi	643 19	619 90	23 29	268	1,217	4,153	19	830 11	
32 Drayton	410 55	382 20	28 35	274	2,432	3,939	18	1,428 35	
33 Dutton	344 83	344 26	57	289	806	3,574	13	569 48	
34 Enterprise	133 63	133 63		160	685	1,249	8	351 21	
35 Erin	171 98	169 11	2 87	166	1,452	4,714		991 00	
36 Exeter	618 39	615 79	2 60	430	3,276	8,824	17	2,302 60	
37 Fordwich	346 41	246 41		176	1,398	3,720		922 54	17 33
38 Forest	559 81	525 58	34 23	576	3,551	9,324	22	2,764 23	148 20
39 Garden Island	1,047 83	608 83	439 00	156	4,900	899	34	3,139 00	
40 Georgetown	480 91	466 77	14 14	355	2,154	7,195	32	1,814 14	50 00
41 Glencoe	197 00	197 00		362	1,500			697 00	
42 Gore Bay	201 58	181 80	19 78	342	1,318	1,413		1,642 23	14 75
43 Gorrie	194 35	190 07	4 28	101	1,545	3,160		993 65	
44 Grand Valley	178 17	173 64	4 53	214	1,744	2,965	13	1,090 10	
45 Grantham (St. Catharines, P.O.)	290 19	288 18	2 01	144	858	1,632		539 01	100 00
46 Gravenhurst	226 69	179 95	46 74	414	1,660	16,816		918 95	50 00
47 Guelph	1,622 96	1,622 96		1,190	9,912	60,324	46	9,650 00	
48 Hagarsville	431 45	422 30	9 15	300	1,318	4,827	16	872 74	150 31
49 Hamilton	14,392 95	14,303 30	89 65	11,792	26,262	215,652	248	60,993 76	31,400 00
50 Hanover	207 46	189 16	18 30	225	430	2,832		199 66	173 50
51 Ingersoll	784 28	681 41	102 87	892	3,339	19,792	25	2,102 87	
52 Iroquois	346 04	314 85	31 19	170	1,520	2,526	27	1,585 19	
53 Kingsville	434 15	361 01	73 14	150	928	2,559	17	823 14	
54 Lakefield	259 55	214 43	45 12	154	719	3,849	18	495 12	27 35
55 Lanark	275 91	269 68	6 23	380	837	6,225	15	496 87	
56 Lancaster	165 07	154 70	10 37	208	2,016	2,899		1,135 37	
57 Leamington	532 81	508 26	24 55	755	1,605	10,735	20	1,110 45	
58 Lindsay	1,211 16	1,142 68	68 48	369	2,627	4,450	44	2,668 48	210 00
59 Listowel	349 80	296 99	53 81	335	2,170	3,681	21	1,502 81	64 80
60 Little Current	129 46	129 00	46	134	1,225	10,050		725 70	
61 London	9,097 05	7,548 15	1,548 90	5,000	12,505	85,052	189	33,355 73	22,409 71
62 Lucan	409 11	362 41	46 70	180	2,096	7,210		1,856 70	120 00

TABLE C.—Receipts, Expenditures, Assets and Liabilities of Free Libraries.—*Con.*

Free Libraries.	Receipts.	Expenditures.	Balances on hand.	Number of members.	Number of volumes in Libraries.	Number of volumes issued.	Number of newspapers and periodicals	Assets.	Liabilities.
	$ c.	$ c.	$ c.					$ c.	$ c.
63 Lucknow	242 59	231 20	11 39	246	2,312	4,790	22	1,211 39	
64 Merrickville	50 00	50	49 50	195	1,601	300		2,049 50	
65 Merritton	353 20	227 08	126 12	172	1,193	4,416		832 34	21 90
66 Millbrook	504 29	502 26	2 03	184	1,194	4,640	27	747 03	162 95
67 Milverton	203 55	203 37	18	227	1,059	3,068		679 80	
68 Mitchell	577 43	501 94	75 49	271	3,444	6,674	21	4,584 92	
69 Mono Centre	133 62	133 62		108	711	1,275		375 00	74 52
70 Newburg	262 97	258 94	4 03	189	1,685	2,491	21	1,255 08	136 51
71 Niagara Falls S	199 68	199 68		381	2,022	5,214		1,235 00	25 00
72 North Augusta	121 35	115 52	5 83	130	631	1,992		350 53	50 00
73 North Bay	339 57	309 49	30 08	321	1,521	5,435	22	1,401 00	6 25
74 Oil Springs	423 63	395 55	28 08	224	1,114	4,434		805 00	
75 Oshawa	581 39	562 53	18 86	292	2,447	4,919	36	1,520 86	110 00
76 Otterville	205 29	159 31	45 98	177	425	1,946		307 97	118 00
77 Parkhill	243 64	225 39	18 25	260	1,591	4,943		1,004 25	11 75
78 Parry Sound	420 51	381 00	39 51	176	1,035	3,628	18	779 51	
79 Penetanguishene	634 29	634 29		306	4,268	9,200	30	2,250 00	98 00
80 Port Carling	150 52	150 52		114	842	1,194	13	570 00	94 33
81 Port Colborne	164 58	164 08	50	314	1,448	4,850		1,093 15	1 50
82 Port Rowan	294 45	294 45		202	1,636	3,461		1,692 58	201 72
83 Primrose	126 66	125 66	1 00	109	679	1,629		701 00	50 00
84 Prescott	512 99	469 50	43 49	642	4,145	12,461	23	4,738 98	
85 Renfrew	550 95	536 21	14 74	300	3,143	11,104	20	3,509 74	22 92
86 Richmond Hill	311 35	253 39	57 96	108	2,657	3,708	28	1,957 96	
87 Ridgeway	150 95	140 42	10 53	189	655	2,570		418 61	
88 Sault. Ste. Marie	568 21	514 69	53 52	530	1,609	9,043	18	1,243 52	
89 Shelburne	407 49	404 50	2 99	252	1,715	5,615	22	1,318 82	
90 Simcoe	1,007 10	1,007 10		532	4,628	10,702	41	6,500 00	128 60
91 Smith's Falls	897 58	897 58		662	3,867	14,672	14	1,575 00	200 16
92 Springfield	390 54	388 35	2 19	175	1,010	1,835		724 58	355 00
93 Stayner	142 93	137 57	5 36	243	1,208	4,808		766 51	
94 Stouffville	479 92	410 97	68 95	201	3,335	3,410	26	3,428 95	
95 Stratford	2,751 12	2,379 66	371 46	1,028	4,641	26,401	38	4,042 20	
96 St. Catharines	2,130 96	1,805 84	325 12	1,749	7,023	41,730	45	5,806 12	
97 St. Mary's	460 71	388 14	72 57	679	4,777	12,334	22	4,672 57	
98 St. Thomas	1,658 12	1,553 92	104 20	1,197	6,955	21,257	45	4,704 20	
99 Sundridge	240 95	240 95		162	633	1,905	16	395 00	
100 Tamworth	342 46	342 46		169	862	2,329	29	425 95	41 05
101 Thessalon	326 06	325 99	07	249	1,178	4,937	15	515 14	203 57
102 Thorold	524 37	443 73	80 64	650	4,248	7,574	23	5,519 32	
103 Toronto	33,283 90	31,364 97	1,918 93	29,054	108,376	608,424	840	240,262 49	54,925 96
104 Tottenham	350 71	318 91	31 80	115	2,006	3,095		1,264 71	
105 Uxbridge	900 69	900 69		486	5,039	11,842	29	9,000 00	
106 Vars	122 32	122 32		46	320	284		217 06	3 45
107 Victoria (Caledonia P.O.)	134 80	130 85	3 95	110	1,832	1,269		1,334 01	
108 Wallaceburg	749 91	671 13	78 78	404	821	7,551	20	717 16	188 33
109 Wardsville	118 35	115 85	2 50	196	1,161	2,264		744 07	1 00
110 Waterford	318 99	318 99		287	1,120	4,740		715 00	3 96
111 Waterloo	601 99	509 70	92 29	850	6,339	8,280	37	5,043 49	
112 Walford	441 10	419 31	21 79	200	1,822	3,425	22	1,461 79	169 27
113 Westford	88 25	77 25	11 00	110	987	829		775 09	
114 Wiarton	580 94	580 94		302	2,424	5,588	25	1,727 85	235 34
115 Windsor	3,127 68	2,529 91	597 77	1,286	7,731	36,381	54	7,034 82	
116 Wroxeter	280 99	247 63	33 36	243	3,906	4,082		3,752 17	
117 Wyoming	261 94	252 91	9 03	137	1,711	4,116		1,423 13	65 24
Total	117,545 84	109,138 79	8,407 05	89,148	425,923	1,812,489	3,122	577,580 09	113,902 49

PROPORTIONATE NUMBER OF VOLUMES IN PUBLIC LIBRARIES.

Libraries with less than 250 volumes.

Bracondale, Calabogie, Dundela, Fort Francis, Gores Landing, Mississippi, Pelee Island, Spencerville, Thornloe, Unionville.

Libraries with over 250 and less than 500 volumes.

Allan's Mills, Alma, Angus, Bayham, Bridgeburg, Burnstown, Cambray, Cookstown, Copleston, Dalhousie, (McDonald's Corners) Fenella, Hanover, Harrington, Kearney, Maple, Melancthon, Minden, Monkton, Mount Albert, Odessa, Otterville, Pakenham, Pinkerton, Rosemont, Shakespeare, South River, Thornhill, Trout Creek, Vars, White Lake, York. Zephyr.

Libraries with over 500 and less than 1,000 volumes.

Admaston, Atwood, Auburn, Belwood, Bervie, Cargill, Carp, Cayuga, Chesterville, Clarksburg, Cold Springs, Coldwater, Comber, Copper Cliff, Creemore, Don, Dorchester, Douglas, Dresden, Dryden, Dutton. Easton's Corners, Elmvale, Enterprise, Glen Allan, Grantham, (St. Catharines P.O.) Harrow, Hepworth, Holland Centre, Kenburn, Kingsville, Kinmount, Kintore, Lakefield, Lanark, Lynden, Mallorytown, Manitowaning, Melbourne, Midland, Mildmay, Mono Centre, Mono Mills, Morriston, Napanee Mills, North Augusta, Oakland, Omemee, Orono, Plattsville, Port Carling, Port Credit, Port Stanley, Primrose, Princeton, Richmond, Ridgeway, Riverdale, Rockwood, Rodney, Scotland, Shallow Lake, Shedden, Sundridge, Tamworth, Thornbury, Violet Hill, Wallaceburg, Warkworth, Westford, West Lorne, Williamstown, Winchester

Libraries with over 1,000 and less than 1,500 volumes.

Acton, Algonquin, Alvinston, Beaverton, Belmont, Bloomfield, Blyth, Bagnor, Brighton, Brooklin, Burford, Burk's Falls, Camden East, Chapleau, Cheapside, Chesley, Coldstream, Delhi, Dufferin, (Clanbrassil P.O.) Dungannon, Erin, Ethel, Flesherton, Floradale, Fordwich, Gore Bay, Hagersville, Hensall, Highland Creek, Islington, Kars, King, Kirkfield, Lake Charles, Little Britain, Little Current, Manotick, Merritton, Millbrook, Milverton, Nanticoke, North Gower, Oil Springs, Oxford Mills, Palmerston, Parry Sound, Pickering, Port Arthur, Port Colborne, Port Perry, Russell, Schreiber, Springfield, Stayner, St. Helens, Sunderland, Thamesford, Thedford, Thessalon, Tilbury, Tilbury East, (Valetta P.O.) Tiverton, Wardsville, Waterford, Wheatley, Woodbridge.

Libraries with over 1,500 and less than 2,000 Volumes.

Alliston, Arkona, Arnprior, Beamsville, Belfountain, Bradford, Burlington, Caledonia Cannington, Cardinal, Claremont, Colborne, Duart, Glencoe, Glenmorris, Gorrie, Grand Valley, Gravenhurst, Holyrood, Huntsville, Inglewood, Iroquois, Leamington, Manilla, Markdale, Merrickville, Mono Road, Newburgh, New Hamburg, Newmarket, North Bay, Norwood, Parkhill, Pembroke, Picton, Port Rowan, Queensville, Rat Portage, Romney, Sault Ste Marie, Shelburne, Sparta, Tara, Underwood, Vandorf, Victoria (Caledonia P.O.), Waterdown, Watford, Woodville, Wyoming.

Libraries with over 2,000 and less than 2,500 Volumes.

Baden, Beeton, Bobcaygeon, Bolton, Bracebridge, Brussels, Caledon, Chatsworth, Cheltenham, Claude, Deseronto, Dundalk, Eunotville, Essex, Fonthill, Fort Erie, Gananoque, Georgetown. Lancaster, Listowel, Lucan, Lucknow, Niagara Falls South, Oshawa, Point Edward, Tavistock, Tilsonburg, Tottenham, Walkerton, Whitby, Wiarton.

Libraries with over 2,500 and less than 3,000 Volumes.

Aberarder, Almonte, Arthur, Aurora, Blenheim, Bowmanville, Clifford, Cobourg, Cornwall, Dunnville, Elmira, Hespeler, Jarvis, Lindsay, Markham, Morrisburg, Mount Forest, Oakville, Orangeville, Richmond Hill, Thamesville, Toronto Junction, Weston, Wingham.

Libraries with over 3,000 and less than 3,500 Volumes.

Aylmer, Ayr, Brampton, Carleton Place, Exeter, Fenelon Falls, Forest, Ingersoll, Meaford, Mitchell, Napanee, Norwich, Port Elgin, Renfrew, Ridgetown, Stouffville, Streetsville, Teeswater, Welland.

Libraries with over 3,500 and less than 4,000 volumes.

Belleville, Campbellford, Clinton, Durham, Goderich, Harriston, Orillia, Paisley, Perth, Smith's Falls, Southampton, Wroxeter,

Libraries with over 4,000 and less than 5,000 volumes.

Alton, Barrie, Embro, Fergus, Galt, Garden Island. Grimsby, Kincardine, Milton, Niagara, Niagara Falls, Owen Sound, Penetanguishene, Port Hope, Prescott, Scarboro, Simcoe, St. George, St. Marys, Stratford, Strathroy, Thorold.

Libraries with over 5,000 and less than 6,000 volumes.

Collingwood, Kingston, Preston, Seaforth, Uxbridge, Woodstock.

Libraries with over 6,000 and less than 8,000 volumes.

Berlin, Chatham, Dundas, Paris, St. Catharines, St. Thomas, Waterloo, Windsor.

Libraries with over 8,000 and less than 10 000 volumes.

Brockville, Elora, Guelph, Peterboro.

Libraries with over 10,000 and less than 20,000 volumes.

Brantford, London.

Libraries with over 20,000 and less than 30,000 volumes.

Hamilton.

Library with over 100,000 volumes.

Toronto.

III. ART SCHOOLS AND DEPARTMENTAL DRAWING EXAMINATIONS.

Tables D to H show the number of Certificates awarded from the commencement of this branch of the Education Department, 1882 to 1899.

TABLE D.—Certificates awarded in Primary Art Course from 1882 to 1899.

Year.	Freehand drawing.	Geometry.	Perspective.	Model drawing.	Blackboard drawing.	Teacher's certificates.	Total.
1882	28	21	17	12	28	.....	106
1883	84	89	58	47	76	.....	354
1884	153	174	139	138	86	66	756
1885	214	529	301	168	198	122	1,532
1886	634	672	149	662	414	77	2,608
1887	643	1,204	428	444	122	103	2,944
1888	805	882	520	403	236	133	2,979
1889	1,002	961	394	470	494	187	3,508
1890	1,000	1,009	290	811	313	130	3,553
1891	1,085	1,569	292	746	422	164	4,278
1892	1,361	1,419	569	1,120	720	338	5,527
1893	1,769	1,277	439	876	392	220	4,973
1894	1,383	719	548	550	562	153	3,915
1895	1,813	1,429	658	1,311	991	341	6,543
1896	1,195	569	361	1,110	1,121	265	4,621
1897	716	500	212	704	516	114	2,762
1898	854	311	173	1,224	604	149	3,315
1899	1,062	465	168	1,128	1,170	160	4,153
Total	15,801	13,799	5,716	11,924	8,465	2,722	58,427

TABLE E.—Certificates Awarded in Advanced Art Course from 1883 to 1899.

Year.	Shading from flat.	Outline from round.	Shading from round.	Drawing from flowers.	Ornamental design.	Industrial design.	Teachers' certificates.	Total.
1883	5	5	12	18	.....	.....	.....	40
1884	16	5	12	12	.....	.....	.....	45
1885	33	18	35	29	.....	.....	4	119
1886	35	24	19	48	.....	.....	3	129
1887	59	27	28	25	34	.....	14	187
1888	22	17	39	44	20	.....	9	151
1889	65	36	58	24	25	.....	14	222
1890	62	30	76	43	22	.....	15	248
1891	80	52	67	66	38	.....	23	326
1892	24	32	53	72	37	.....	13	231
1893	58	54	73	62	54	.....	13	314
1894	31	44	58	79	68	.....	24	304
1895	56	52	78	58	29	.....	11	284
1896	60	74	103	113	.....	29	17	396
1897	61	47	126	95	.....	41	18	388
1898	67	73	169	187	.....	44	18	558
1899	61	69	152	160	.....	57	22	521
Total	795	659	1,158	1,135	327	171	218	4,463

TABLE F.—Certificates Awarded in Industrial Art Course from 1885 to 1899.

Year.	Modelling in clay.	Wood carving.	Wood engraving.	Lithography.	Painting on china.	Total.
1885	14	.....	.....	.....	.....	14
1886	11	7	.....	.....	.....	18
1887	8	2	.....	.....	.....	10
1888	10	3	1	1	9	24
1889	7	1	3	2	6	19
1890	7	4	.....	1	6	18
1891	5	2	1	.....	7	15
1892	2	1	.....	1	3	7
1893	5	2	.....	1	3	11
1894	4	2	.....	2	10	18
1895	5	3	2	6	18	34
1896	3	2	.....	3	30	38
1897	5	3	1	4	17	30
1898	7	5	.....	1	17	30
1899	9	14	..	2	17	42
Total	102	51	8	24	143	328

TABLE G.—Certificates awarded in Mechanical Drawing Course from 1883 to 1899.

Year.	Advanced geometry.	Machine drawing	Building construction.	Industrial design.	Architectural design.	Advanced perspective.	Teachers' certificates.	Total.
1883	2	3	1	2	.....	3	.....	11
1884	1	1	1	1	.....	1	.....	5
1885	12	32	4	25	.....	12	4	89
1886	14	13	5	28	.....	14	3	77
1887	6	5	12	18	.....	6	2	49
1888	8	7	7	15	.....	11	2	50
1889	13	23	11	20	.....	12	3	82
1890	11	23	5	8	.....	12	2	61
1891	3	31	8	31	.....	28	2	103
1892	17	25	13	38	.....	15	2	110
1893	14	33	10	47	...	35	10	149
1894	12	17	6	90	.....	9	3	137
1895	5	22	9	31	.....	12	3	82
1896	7	9	5	.....	9	12	3	45
1897	16	13	4	.....	6	15	.....	54
1898	6	19	2	.....	7	8	.....	42
1899	25	20	5	.....	7	18	.....	75
Total	172	296	108	354	29	223	39	1,221

TABLE H.—Certificates awarded for Extra Subjects from 1885 to 1899.

Year.	Drawing from the antique.	Shading from casts.	Architectural designs.	Drawing from life.	Painting from life.	Painting oil colors.	Painting water colors.	Sepia.	Monochrome.	Pastel.	Sculpture in marble.	Photogravure.	Repousse work.	Industrial design.	Pen and ink.	Machine drawing.	Engraving on copper.	Crayon portraits.	Total.
1885	..	..	..	..	..	9	7	..	..	..	..	..	..	..	..	..	..	..	16
1886	..	..	..	..	..	12	7	..	..	..	..	..	..	..	..	..	..	..	19
1887	..	..	..	7	..	32	9	..	..	..	..	..	2	..	..	..	..	..	50
1888	..	..	..	15	12	25	14	13	1	..	2	..	2	..	..	..	..	..	84
1889	..	..	..	12	8	16	21	3	2	..	..	..	..	..	..	..	..	..	62
1890	..	..	..	7	4	28	18	10	4	..	..	..	..	..	..	..	..	..	71
1891	..	..	..	4	5	29	26	3	6	..	..	..	..	..	..	..	..	..	73
1892	..	..	..	2	6	21	16	7	1	..	..	..	..	..	..	..	..	2	55
1893	11	..	2	5	9	35	21	7	4	..	..	..	..	..	..	..	..	..	94
1894	11	..	2	8	6	29	16	5	7	..	..	..	..	10	..	1	..	..	95
1895	26	..	6	14	4	39	24	10	1	..	..	..	..	17	..	5	1	..	147
1896	14	..	..	12	6	34	38	6	1	2	..	1	..	13	1	1	..	..	129
1897	19	11	1	17	6	38	42	7	3	3	..	3	..	22	3	4	..	..	179
1898	22	12	..	12	9	37	28	7	6	6	1	6	..	15	4	6	..	..	171
1899	19	14	..	17	2	10	22	8	1	4	..	3	..	31	13	5	..	..	149
Total	122	37	11	132	77	394	309	86	37	15	3	13	4	108	21	22	1	2	1,394

TABLES I to M.—Show the number of certificate awarded to Art Schools in 1899.

TABLE I.—Certificates Awarded to Art Schools, 1899.—Primary Course.

Art Schools.	Number of students for examination.	Number of proficiency certificates.						Number of Teachers' Certificates.	Grants for Certificates.
		Freehand.	Geometry	Perspective.	Model.	Blackboard.	Total Proficiency Certificates.		$ c.
Hamilton	105	38	15	7	41	31	132	7	96 00
Kingston	23	8	2	3	7	8	28	2	22 00
London	7	4	5	1	4	4	18	1	9 00
Ottawa	24	4	..	..	5	2	11	..	9 00
St. Thomas	25	6	7	2	9	7	31	2	24 00
Toronto	44	23	8	8	24	24	87	2	63 00
Total	228	83	37	21	90	76	307	14	223 00

TABLE J.—Certificates Awarded to Art Schools, 1899.—Advanced Course.

Art Schools.	Number of students for examination.	Number of proficiency certificates.						Number of Teachers' Certificates.	Grants for Certificates.
		Shading from Flat.	Outline from Round.	Shading from Round.	Drawing from Flowers.	Industrial design.	Total Proficiency Certificates.		
									$ c.
Hamilton	95	10	13	30	27	4	84	5	73 00
Kingston	12		1	4	5	1	11	1	11 00
London	8	1			3	3	7		7 00
Ottawa	11	1	2	3	7	3	15		12 00
St. Thomas	29	4	2	5	4	3	18		17 00
Toronto	57	11	22	25	28	6	92	3	71 00
Total	212	27	40	66	74	20	227	9	191 00

TABLE K —Certificates Awarded to Art Schools, 1899.—Mechanical Course.

Art Schools.	Number of students for examination.	Number of proficiency certificates.						Grants for Certificates.
		Advanced Geometry.	Machine Drawing	Building Construction.	Architectural Design.	Advanced Perspective.	Total Proficiency Certificates.	
								$ c.
Hamilton	25	4	1	1	1	4	11	9 00
Kingston	11	1					1	1 00
London	4		3				3	3 00
Ottawa	6		1	1	1		3	3 00
St. Thomas	18	4	5	2	2	1	14	12 00
Toronto	7	5				5	10	5 00
Total	71	14	10	4	4	10	42	33 00

TABLE L.—Certificates Awarded to Art Schools, 1899.—Industrial Art Course.

Art Schools.	Number of proficiency certificates.					Grants for Certificates.
	Modeling in Clay.	Wood Carving.	Lithography.	Painting on China.	Total Proficiency Certificates.	
						$ c.
Hamilton	5	1	1	1	8	7 00
Kingston	1				2	2 00
Ottawa	1				1	1 00
St. Thomas		3			3	3 00
Toronto			1		1	1 00
Tosal	8	4	2	1	15	14 00

TABLE M.—Certificates Awarded to Art Schools, 1899.—Extra Subjects.

Art Schools.	Number of students for examination.	Number of proficiency certificates.											
		Painting from Life.	Painting Oil Colors.	Painting Water Colors.	Monochrome.	Sepia.	Drawing from Life.	Pen and Ink Sketches.	Shading from Antique.	Shading from Casts.	Industrial Design	Machine Drawing.	Drawings for Photogravures.	Total.
Hamilton	36	....	....	3	....	8	....	1	7	4	4	3	2	32
Ottawa	20	....	1	1	....	....	3	....	2	2	11	1		21
St. Thomas	20	....	....	....	....	....	....	....	....	....	2	..	....	2
Toronto	36	2	2	1	1	....	7	5	10	6	4	....	1	39
Total	112	2	3	5	1	8	10	6	19	12	21	4	3	94

TABLES N and O.—Show the number of certificates awarded to Public Libraries in 1899.

TABLE N.—Certificates Awarded to Public Libraries in 1899.—Primary Course.

Public Libraries.	Number of students for examination.	Number of proficiency certificates.					
		Freehand.	Geometry.	Perspective.	Model.	Blackboard.	Total Proficiency Certificates.
Galt	3	1	.....	.....	1	....	2
	3	1	.....	.....	1	.....	2

TABLE O.—Certificates Awarded to Public Libraries in 1899.—Mechanical Course.

Public Libraries.	Number of students for examination.	Number of proficiency certificates.					
		Advanced Geometry.	Machine Drawing.	Building Construction.	Architectural Design.	Advanced Perspective.	Total Proficiency Certificates.
Galt	11	.....	2	.....	.....	.. ....	3 2
Peterboro	13	.....	5	.....	.....	.....	
	24	.....	7	.....	.....	.....	7

TABLES P to T, show the number of Certificates awarded to Public and High Schools, Ladies Colleges, &c., in 1899.

TABLE P.—Certificates Awarded to Public and High Schools, Ladies' Colleges, etc., 1899.—Primary Course.

Name.	Number of students for examination.	Number of proficiency certificates taken.						Number of Teachers' Certificates.
		Freehand.	Geometry.	Perspective.	Model.	Blackboard.	Total Proficiency Certificates.	
Athens High School	84	22	28	.....	43	50	143	1
Arthur "	1	.....	1	1	1	1	4	.....
Beaverton Public School	17	9	1	.....	13	13	36	.....
Belleville Albert College	16	6	1	.....	8	9	24	.....
" High School	47	14	1	.....	25	25	65	.....
" Loretto Academy	42	12	6	2	13	9	42	2
Bloomfield Public School	26	12	7	.....	4	17	40	.....
Bridgeburg "	1	.....	.....	1	.....	.....	1	.....
Brockville Collegiate Institute	93	57	7	8	71	56	199	3
Deseronto High School	26	7	9	.....	13	9	38	.....
Dundas "	38	26	.....	.....	19	18	63	.....
Forest "	32	11	3	.....	12	12	38	2
Hamilton Collegiate Institute	120	73	.....	.....	71	65	209	.....
" Queen Victoria School	43	20	29	12	18	23	102	11
" Ryerson School	39	28	27	21	22	28	126	18
Ingersoll Collegiate Institute	56	18	4	.....	17	27	66	.....
London "	94	46	.....	.....	56	54	156	.....
Markham High School	107	34	35	15	30	36	150	19
Meaford "	29	13	10	.....	12	15	50	1
Morrisburg Collegiate Institute	68	17	28	3	21	23	92	3
" Public School	24	6	2	.....	7	8	23	.....
Niagara Falls Loretto Academy	22	7	3	3	4	6	23	3
Norwood High School	1	1	1	1	1	1	5	1
Oshawa "	71	35	9	.....	31	29	104	.....
Ottawa Presbyterian Ladies' Coll.	8	8	.....	.....	3	.....	11	.....
" Technical School	28	12	.....	.....	15	11	38	.....
Owen Sound Collegiate Institute	99	55	58	20	65	53	251	15
Parkdale Public School	7	6	.....	1	5	5	17	1
Parkhill High School	14	2	.....	.....	7	7	16	.....
Perth Collegiate Institute	54	38	.....	1	39	36	114	.....
Peterboro' High School	1	1	1	1	1	1	5	1
Picton "	84	41	45	25	31	53	195	19
Port Dover "	26	11	.....	.....	18	19	48	.....
Ridgetown Collegiate Institute	3	1	1	1	1	1	5	.....
Streetsville High School	15	12	.....	.....	15	12	39	.....
Stratford Loretto Convent	38	26	5	2	29	27	89	1
St. Thomas Alma College	38	27	5	1	2	4	39	.....
Thorold, High School	1	.....	.....	.....	1	1	2	.....
Toronto, Dewson St. P. School	17	6	4	.....	9	8	27	.....
" Harbord St. Coll. Inst.	54	38	.....	.....	42	41	121	1
" Loretto Abbey	109	31	15	6	39	52	143	3
" " Academy	28	5	8	.....	9	7	29	.....
" " High School	33	16	1	3	11	29	60	7
" Met. School of Music	6	.....	.....	.....	1	4	5	1
" St. Joseph's Convent	56	28	12	5	21	27	93	7
Tottenham Public School	1	1	1	1	1	1	5	1
Uxbridge High School	23	14	5	.....	16	17	52	.....
Wallaceburg Public School	60	29	.....	1	27	25	82	2
Watford "	1	.....	.....	1	.....	.....	1	.....
Whitby Collegiate Institute	61	20	21	.....	33	39	113	1
Williamstown High School	26	4	.....	.....	7	7	18	.....
Windsor Collegiate Institute	114	45	33	10	46	42	176	7
Woodstock "	68	27	1	1	31	31	91	.....
	2,170	978	428	147	1,037	1,094	3,684	131

TABLE Q.—Certificates Awarded to High Schools, Ladies' Colleges, etc., 1899.—Advanced Course.

Name.	Number of students for examination.	Number of proficiency certificates taken.						Number of teachers' certificates.
		Shading from flat.	Outline from round.	Shading from round.	Drawing from flowers	Industrial design.	Total proficiency certificates.	
Belleville Albert College	9	1	.....	1	6	.....	10	.....
" High School	48	2	.....	12	7	....	21	.....
" Loretto Academy	37	4	1	5	6	4	20	2
Niagara Falls do	17	1	.....	6	2	4	13	.....
Ottawa Presbyterian Ladies' College	2	1	.. .	1	.....	....	2	... ..
" Technical School	22	5	5	7	17	5	39	1
St. Thomas Alma College	7	2	2	2	3	3	12	....
Stratford Loretto Convent	18	6	3	13	12	7	41	4
Toronto " Abbey	96	9	15	32	24	11	91	4
" " Academy	19	...	.....	6	1	.....	7	.....
" Metropolitan School of Music	6	....	...	... .	4	.....	4	.....
Whitby Collegiate Institute	5	2	.....	1	2	.....	5	1
Windsor " "	4	1	3	..	2	1	7	1
Total	290	34	29	86	86	37	272	13

TABLE R.—Certificates Awarded to Public Schools, High Schools, etc., 1899.—Mechanical Course.

Name.	Number of students for examination.	Number of proficiency certificates taken.					
		Advanced Geometry.	Machine drawing.	Building construction.	Architectural design.	Advanced perspective.	Total proficiency certificates.
Arthur High School	1	1	.....	.....	.....	1	2
Bridgeburg Public School	1	1	.....	.....	.....	1	2
Charing Cross "	1	1	.....	.....	.....	1	2
Cornwall High School	1	.....	.....	.....	.....	.....	.....
Forest "	1	1	.....	.....	.....	1	2
Ingersoll Collegiate Institute	2	....	....	.....	.....	.....	.....
Markham High School	4	... .	.....	.....	.....	.....	.....
Morrisburg Collegiate Institute	1	.....	.....	.... .	.....	....	....
Norwood High School	1	1	....	.....	.....	1	2
Ottawa Technical School	12	.....	2	1	3	.....	6
Perth Collegiate Institute	1	.....	.....	.....	.....	.....	.....
Peterboro High School	1	1	....	.....	.....	.....	1
Ridgetown Collegiate Institute	4	1	.....	.....	.....	.....	1
Thorold High School	1	1	.....	.....	.....	1	2
Tottenham Public School	1	1	.....	.....	.....	1	2
Watford "	1	1	.....	.....	.....	.....	1
Whitby Collegiate Institute	1	.....	1	.....	.....	.....	1
Windsor "	3	1	.....	....	.....	1	2
Total	38	11	3	1	3	8	26

TABLE S.—Certificates Awarded to Ladies' Colleges etc., in 1899.—Industrial Art Course.

Name.	Number of Students.	Wood Carving.	Modelling in clay.	China Painting.	Total.
Ottawa Technical School	10	10	.....	.....	10
St. Thomas Alma College	1	.....	1	.....	1
Toronto Loretto Abbey	16	.....	.....	16	16
Total	27	10	1	16	27

TABLE T.—Certificates awarded to Ladies' Colleges, etc., 1899.—Extra subjects.

Name.	Number of students for examination.	Number of certificates taken.								Total.
		Painting, oil colors.	Painting, water colors.	Industrial design.	Drawing from life.	Pen and ink sketches.	Pastel.	Shading from casts.	Machine drawing.	
Belleville, Albert College	7	2	5	1	....	.....	.....	.....	.....	8
" High School	8	.....	.....	.....	.....	.....	.....	.....	.....	3
Ottawa, Presbyterian Ladies College	3	1	2	3	.....	.....	.....	.....	..	3
" Technical School	29	.....	.....	5	7	7	.....	1	1	21
St. Thomas, Alma College	11	3	5	.....	.....	.....	4	.....	.....	12
Toronto, Loretto Abbey	13	.....	4	.....	....	.....	.....	.....	.....	4
Whitby, Collegiate Institute	2	1	1	1	.....	.....	.....	1	.....	4
	73	7	17	10	7	7	4	2	1	55

TEACHERS' FULL CERTIFICATES.

The following full certificates in the Primary and Advanced Courses were awarded in 1899.

1. Teachers' Full Certificates Primary Course.

Name.	Address.
Males.	
Aberhart, Williams	Hamilton.
Baines, Chas. R.	Hamilton.
Baker, Godfrey	Kingston.
Blanchard, Alex	"
Brace, Wm.	Markham.
Carmichael, Duncan	Markham.
Casselman, Riley	Morrisburgh.
Chagnon, Ernest	Hamilton.
Cloes, Chester	Aylmer.
Dalton, Hugh	Brockville.
Dandy, Wm. P	Toronto.
Davis, George	Aylmer.
Dobbie, John A.	Hamilton.
Dobson, Wm.	Picton.
Duck, George	Windsor.
Edgar, Walter	Owen Sound.
Ewens, Sidney W.	" "
Foster, Walter	Markham.
Gallagher, Wilbert	Picton.
Goodwin, Joseph	Harriston.
Hess, Leon	Picton.
Huff, Samuel	Meaford.
Jamieson, Jno. W.	Hamilton.
Johnson, R. W.	St. Thomas.
Jolliffe, Norman	Picton.
Kilbourn, Fred B.	Owen Sound.
Lapine, Ernest	Windsor.
Leavens, Ralph	Picton,
Leavitt, Jas	Picton.
Linklater, Wm. A.	Hamilton.
Liston, John	Brockville.
Luton, George	Aylmer.
Mathews, Stanley W.	Peterboro.
Moore, Edgar.	Markham.
Morden, Garnet	Picton.
McDonald, Claude	"
McGillivray, Jno	"
McKeown, Jno.	Hamilton.
Norris, James	Owen Sound.
North, Sparling	Hamilton.
Orr, Vernon	Hamilton.
Parks, Wm.	Markham.
Paterson, Chas.	Hamilton.
Pepper, Samuel	Forest.
Powell, Herbert	Hamilton.
Reesor, Bert	Markham.
Richards, N.	Windsor.
Richardson, Earl A.	Aylmer.
Robb, Wesley	Morrisburgh.
Robbins, Walter	Markham.
Runions, J. E.	Morrisburgh.
Russel, P. W.	Parkhill.
Sanders, Edwin G.	Markham.
Snowden, H. A.	Norwood.
Sullivan, H.	Windsor.
Taylor, L. W.	Tottenham.
Thorndyke, Russell	Whitby.
Tomlinson, J.	Markham.
Trimble, Lorne	Hamilton.
Weeks, Fred	Picton.
Welland, Fred	Markham.
White, Arthur	"
Williams, Walter	Hamilton.
Williamson, Percy	Picton.
Wilson, Wm.	Whitby.
Females.	
Aiton, Aggie	Markham.
Austin, Mazie	Hamilton.
Balfour, Constance	Hamilton.
Barker, Muriel	Picton.
Bartlet, Bessie	Windsor
Bell, Gertrude	Toronto.
Boyd, F.	Toronto.
Burns, Carrie	Wallaceburg.
Callahan, May	Toronto.
Campton, Lottie	"
Christie, Katie C.	Owen Sound.
Clark, Evalene	Picton.
Clark, Mary E.	Owen Sound.
Clark, Maggie	Meaford.
Cookwell, Allie	Whitby.
Cookwell, Lottie	"
Counsell, Emma	Hamilton.
Cushen, A	"
Daly, Alice	Toronto
Davis, Nellie	Belleville.
Downes, Annie	"
Dowrie, Maude	Hamilton.
Dutton, Mabel	Toronto.
Eaton, Alice	Hamilton.
Evans, Lillian	Windsor.

Teachers' Full Certificates.—Primary Course.

Name.	Address.	Name.	Address.
Females.		*Females.*	
Fitzsimmons, Edna	Hamilton.	McKeown, Grace	Hamilton.
Flanagan, Kate	Toronto.	McPherson, Ethel	"
Flanagan, L	Niagara Falls.	McQueston, Ruby	"
Fleming, Ruth E. J.	Owen Sound.		
Forfar, Jennie	Markham.	Noble, Josephine	Toronto.
Formosa, M.	Niagara Falls.		
Fraser, Anna C.	Toronto.	O'Brien, Amanda L.	London.
Fraser, Margaret S.	Hamilton.	O'Malley, Mamie	Toronto.
		Owen, Dora	Picton.
Gammil, Jennie	Hamilton.		
Griffiths, Ada	London.	Phillips, Geraldine	Toronto.
		Phipps, Beatrice N.	Owen Sound.
Hall, Anna	Athens.	Power, Mabel	Wallaceburg.
Harvey, Lillian	Hamilton.	Pumpey, Marie	Hamilton.
Heck, Helen	Toronto.		
Heck, Josephine	"	Rich, Dora	Markham.
Henderson, Edith	Hamilton.	Robinson, Maude	"
Herron, Ethel	Markham.	Robinson, Pearl	Toronto.
Hewitt, M. C.	Stratford.	Row, Lilian	Brockville.
Holman, Minnie	Hamilton.		
Horne, Lena	Whitby.	Saunders, Georgie	Whitby.
		Seaman, Annie L.	Owen Sound.
Johnstone, Lillie W.	Hamilton.	Shannon, Mabel	Picton.
		Shaw, Helen	Owen Sound.
King, Minna	Toronto.	Smith, Edith	Hamilton.
Kirk, B.	"	Smith, Emma	"
Kitchen, Alice	Hamilton.	Smith, J.	Niagara Falls.
		Stevenson, Daisy	Markham.
La Ferte, Rose	Windsor.	Stewart, Grace	Hamilton.
Lane, Edith	Toronto.		
Lampman, Annie E.	Toronto.	Thompson, Addie	Picton.
Lawson, Ethel	Owen Sound.	Toye, Hannah	Hamilton.
Lediard, Ella	Owen Sound.		
Little, Ethel	Hamilton.	Urlocker, Mary	Toronto.
Lush, Jane	St. Thomas.		
		Walker, Abbie	Markham.
Matthews, Nano	Toronto.	Whyte, Evelyn	Hamilton.
Morrison, Annie	Orangeville.	Wilbanke, Lucy	Picton.
		Wright, Lily	"
MacLennan, Jessie C.	Owen Sound.	Wright, Nina	"
MacLennan, Kate	"	Wyman, Caro	Toronto.
McComb, Vina	Whitby.	Wyman, Loraine	"
McFadden, Maude	Hamilton.		

Teachers' Full Certificates.—Advanced Course.

Name.	Address.	Name.	Address.
Adams, Vivian	Belleville.	Kirk, B.	Toronto.
Barnhart, Miss	Toronto.	Kirkpatrick, Ella	Kingston.
Boyd, F.	"	Lampman, Annie E.	Toronto.
Collins, Fred L.	Hamilton.	Michie, Melo	Stratford.
Downs, Sarah	Belleville.	Paterson, David	Hamilton.
Gorman, Tessie	Stratford.	Philp, Violet Ethel	"
Griffith, Ada	London.	Rondot, Eugene	Windsor.
Griffith, Florence	Hamilton.	Smyth, Margaret	Toronto.
Hewitt, M. C.	Stratford.	Stephenson, Roy	Whitby.
Jacks, Lilian	Toronto.	Tuddicombe, A.	Toronto.
Johnson, Sidney B.	Ottawa.	Wells, Anna A.	Stratford.

Gold, Silver and Bronze Medals Awarded in 1899.

The following medals and special certificates were awarded for the year ending 30th April, 1899.

Gold Medal.

Presented by the Minister of Education for Advanced Course :—Original Industrial designs and drawings from the antique, H. A. Sloan, Toronto Art School.

Silver Medal and Certificate.

Presented by the Minister of Education for the best original industrial design, Gertrude Aitcheson, Ottawa Technical School.

Silver Medal and Certificate.

Presented by the Minister of Education for the best Machine Drawing from models, Robert A. Wallace, Hamilton Art School.

Silver Medal and Certificate.

Presented by the Minister of Education for the best original drawings in building construction or architecture, Walter Scott, Hamilton Art School.

Bronze Medals.

For the best painting from life, Mrs. Hime, Toronto Art School.

For the best drawing from life, E. Fosbery, Ottawa Art School.

For the best specimen of china painting, M. Sheedy, Loretto Abbey, Toronto.

For the best specimen of wood carving, L. Perina, Technical School, Ottawa.

For the best specimen of lithography, Frank Kelly, Toronto Art School.

For the best specimen of pen and ink drawing, N. McKechnie, Toronto Art School.

For the best specimen of modeling in clay, G. Gillelan, Ottawa Art School.

For the highest number of marks in Primary Drawing Course, (Art Schools and Ladies' Colleges), R. W. Johnston, St. Thomas Art School,

For the highest number of marks in Primary Drawing course, (High Schools and Collegiate Institutions), John Liston, Brockville Collegiate Institute.

For the highest number of marks in Primary Drawing Course, (Public Schools), Sparling North, Ryerson School Hamilton.

Examination Papers.

The total number of examination papers sent out this year was as follows :

Primary Course

Freehand	1,986	
Geometry	1,040	
Perspective	887	
Model Drawing	1,941	
Blackboard Drawing	2,038	
		7,892

Advanced Course.

Shading, flat	187	
Outline, round	180	
Shading, round	345	
Flower drawing	305	
Industrial design	151	
Competition for gold medal	5	
		1,173

Mechanical Course.

Advanced Geometry	92	
Machine Drawing	91	
Building Construction	52	
Architectural Design	19	
Advanced perspective	79	
		333
Total		9,398

ART SCHOOLS, ETC.—REPORTS FOR 1898 99.

1. *The Report of the Hamilton Art School for the year ending the 30th of April,* 1899, shows that 198 students took the regular course of study during the year. The total number of attendance registered is 8,249.

In addition to the instruction given in all grades to students residing in the city of Hamilton, students from six other towns in the Province participated in the advantages derived from the Hamilton Art School.

As the fees $2.50 for 20 lessons was thought to be more than apprentices and young people could afford to pay, the Directors decided to reduce the amount to $1.00 for 20 lessons, the result was an increased attendance and although there was a slight decrease of income the benefit derived by the students more than counterbalanced the pecuniary loss.

The teaching staff is the same as last year, Mr. S. J. Ireland, Principal, with six assistants.

The equipment of the school has been increased to meet its requirements during the year.

The receipts including the Government Grant, $2,958 72; expenditure, $2,953.72.

2. *The Report of the Kingston Art School for the year ending 30th April, 1899,* shows that the school was removed to a more commodious and central position since the last report; the new rooms are furnished with modern appliances which has been the means of increasing the attendance to 40 students in the day classes, and 20 students in the evening classes.

The following trades, etc. were represented, viz.—Accountants, blacksmiths, carpenters, millers, machinists, students, teachers, etc.

In addition to the four courses prescribed by the Education Department, painting in oil and water colors were taught.

The receipts, including Government Grant, were $626.20; expenditure, $626.20.

3. *The Report of the London Art School for the year ending 30th April, 1899,* shows that owing to the death of Mr. John Griffiths, the late lamented principal, who had been one of the main supporters of the school since 1878, it was found necessary temporarily to

close the school, so as to engage a new principal, consequently there is a decrease in the number of students. The report shows 53 students in the primary course, 23 in the advanced course and 17 in the mechanical course.

The receipts including Government Grant were $972.14; expenditure, $969.96; balance, $2.18.

4. *The Report of the Ottawa Art School for the year ending the 30th April, 1899*, shows that for the purpose of teaching decorative design, the directors engaged at considerable expense a special instructor, certificated by the New York School of Applied Design for Women, whose work they say has been of a highly satisfactory character.

The report shows 37 students in the primary course, 26 in the advanced course, 12 in the mechanical course, 3 in the industrial art course and 18 in oil and water color painting.

The receipts, including Government Grant were, $1,813.70; expenditure, $1,529.50.

5. *The Report of the St. Thomas Art School for the year ending 30th April. 1899.* shows that 27 students attended the primary course, 29 the advanced course, 30 the mechanical course and 16 the industrial art course.

The students in attendance represented the following trades and professions—carpenters, clerks, electricians, machinists, millers, painters, students, teachers, etc.

This School is incorporated with the St. Thomas Free Library, which contributes to its maintenance. The receipts and expenditure are included in the Annual Report of the St. Thomas Free Library.

6. *The Report of the Toronto Art School for the year ending 30th of April, 1899.* shows that 87 students attended the first term, September, 1898, to 3rd December, 1898; 112 students attended the second term, which commenced on the 5th December, 1898, and ended on 18th February, 1899; 110 students attended the third term, which commenced on the 20th February and ended on the 27th April, 1899.

The total number of students for the whole session was 105 males and 55 females; total 160.

The sessional work from this School sent for examination to the Education Department was very successful. The Gold Medal was awarded to an employee of the Grip Publishing Company; the Silver Medal, for Industrial Design, was awarded to an employee of the Heintzman Piano Factory; Medal for Painting to Miss Hillyard, who is now studying abroad; Medal for Drawing from Life to an employee of the Toronto Photo-Engraving Co., and Medal for Lithography to an employee of the Toronto Lithographic Co.

A large number of new casts for the use of the School have been purchased during the past year, which it is hoped will bring the School to a still higher state of efficiency.

The receipts, including Government grant, were $2,574.01; expenditure, $2,512.06; balance on hand, $61.95.

7. *The Report of the Ontario Society of Artists for the year ending 30th of April*, 1899, shows that at the Industrial Exhibition held in Toronto in 1899, 317 pictures were were exhibited.—The 27th Annual Exhibition of the Society held this year was very successful and well patronized.

The following is the list of paintings purchased by the Provincial Government during the past year, also the two works selected by the Society for the Provincial Art Gallery.

Selected by the Education Department.

Road through the Beeches, T. Mower Martin; After the Shower, J. T. Rolph; St. Bernard, W. A. Sherwood; The Stour flowing through Canterbury, C M Manly; Humber River, J. T. Rolph; Jeanne, Miss S. S. Tully; Fine Weather, R F. Gagen; Westminster Bridge, F. M. Bell-Smith; A Surrey Heath, Miss G. E. Spurr; The Fringe of the Lake, R. F. Gagen; Early Summer, C. M. Manly; Tops of Mt. Stephen, M. Matthews; Farm, St. Lawrence River, A. P. Coleman; The Coast of Dorset, W. Cutts.

Selected by the Ontario Society of Artists.

When the Tide is Low, R. F. Gagen ; A Quiet Pool, W. D. Blatchly.

The receipts, including Government grant, were $4,877.92 ; expenditure, $2,886.07 balance, $1,991.85.

8. *Provincial Art Gallery.* In 1895 the Act made provision that out of the Government grant of $500 to the Ontario Society of Artists, the Society shall purchase two pictures annually to the value of $200 from the Society's exhibitors, the said pictures to become the property of the Education Department as a nucleus for the establishment of a permanent Provincial Art Gallery. In 1897 the Minister of Education entered into an agreement with the Society, that provided it would keep one of the large galleries in the Educational Museum filled with the recent works of its members, that pictures would be purchased annually for the Ontario Government and the Provincial Art Gallery, to the value of $800.00.

9. *Provincial Art Schools Exhibitions.* An Industrial Art Exhibition, consisting of specimens of the sessional work sent by Art Schools, etc., to the Education Department in May for competition for medals and certificates awarded at the Annual Departmental Examination, was held on 6th June at the Toronto Board of Trade Buildings, when representatives of Boards of Trade throughout the Dominion met together to discuss the importance of providing technical education for our people.

The exhibition consisted of industrial designs, architectural plans and designs, machine drawings, lithography, modeling in clay, painting on china, pen and ink sketches, wood carving, drawings for photogravures, etc.

A second Art Exhibition was held in connection with the Women's Historical Exhibition at Victoria University on 14th June. The specimens exhibited consisted of drawings from the antique, and casts, outlines from the round, sepias, monochromes, pastels, oil and water color paintings, drawings from life, architectural plans and designs, lithography, drawings for photogravures, pen and ink sketches, wood carving, modeling in clay, painting on china, etc.

10. *School Art Leagues.* Within the past three years great interest has been taken by teachers and parents in the establishment of School Art Leagues, for the purpose of improving the architecture of our schools, and decorating the school rooms so as to surround our children with examples which will develop a taste for the beautiful in nature and art.

Several of the Public Schools in Toronto have formed Art Leagues, and are giving popular lectures, exhibitions and entertainments, which are largely attended and greatly appreciated by the public.

The following is an inaugural address recently given in the Sherbourne Street Methodist School Room, Toronto. by Dr. S. P. May, President of the Dufferin School Art League.

Inaugural Address Given by Dr. S. P. May, C. L. H., Superintendent of Art Schools, to the Officers and Members of the Dufferin Art School League, on the 14th December, 1899.

As President of the Dufferin School Art League, it is my privilege to deliver the inaugural address, which I have divided into three principal headings.

1. The establishment of School Art Leagues in Toronto.

2. A history of the progress of School Architecture and the decoration of School rooms in this Province.

3. An Historical Sketch, showing the importance of Art Education in our manufactures, also its progress in this Province.

1. The Establishment of School Art Leagues in Toronto.

At the opening of the Rosedale Public School in 1896, where Inspector James L. Hughes referred to the advantages of Art Education and the importance of School-room decoration, his remarks induced some of the ladies present to establish a School Art League. These ladies are entitled to the post of honor as having organized the first School Art League in this Dominion ; subsequently, no doubt inspired and encouraged by Mr. Hughes, they proposed a scheme for the formation of other School Art Leagues. and decided to consult with the Ontario Society of Artists, to ask its co-operation in the appointment of an Advisory Board for School Art Leagues in this city.

A conference was held in the Rosedale School in December, 1898, when it was decided to invite the Ontario Society of Artists to take the initiative in the appointment of an Advisory Board. At a subsequent meeting held at the Education Department, five ex-officio members were appointed, also six representatives of the Ontario Society of Artists, six representatives of the Toronto Guild of Civic Art, and three representatives from the Women's Art Association of Canada I consider that the appointment of a good Advisory Board is most judicious, for we all know that one of the greatest obstacles to the advancement of the Fine Arts is the ignorance of many persons, who, because they can afford to purchase a few pictures, would lead you to suppose that they are Art critics ; they may have a vast vocabulary of high-sounding phrases, but they cannot accurately describe the difference between a good or bad painting or design ; they are self-conceited, and will try to make you believe that it requires a special inspiration and education to become the great authorities they profess to be ; although they know, or ought to know, that every, man, woman and child has an innate or infinite love for the beautiful, both in nature and art.

In the prehistoric period, which is said by scientific men to antedate the historic period by hundreds of thousands of years, men and women made ornaments and wore them. In Europe and Asia prehistoric remains have been found showing that primeval man engraved and carved figures of animals on bone and stone in the Palaeolithic or first stone age, before mammoth animals became extinct ; also of the Neolithic or second stone age, when the bones of living animals were mixed with the weapons and implements of bone and stone made by man ; also in the bronze period, when metals had been discovered, and civilization had further advanced, Archaeologists claim that specimens of jewellery, embroidery, modeling and carving manufactured in the earliest ages, have been discovered, which are equal, if not superior, in design and beauty, to similar productions of the present age. It has been well said that, "as the flower precedes the fruit, so decorative Art is developed in a race before it attains proficiency in the practical," therefore I claim that every person, whether rich or poor, inherits a taste for decoration and color, and whatever is beautiful.

The Advisory Board has compiled a pamphlet in which it shows the aim of School Art Leagues. The principal aims are to improve the architecture of schools, to decorate the school-rooms, to provide Art reproductions of paintings, engravings, sculpture, etc., and to encourage the artistic development and taste of our people, which it is maintained will add to the wealth of our country.

I heartily approve of the scheme proposed, and I believe that School Art Leagues will be an important adjunct to our educational system. It is my opinion that as school buildings are erected and paid for from the taxation of the people, it is only fair that the interior decorations should be paid for from individual contributions, and I congratulate the ladies of School Art Leagues on the noble work they have undertaken which I feel confident will be successful and be the means of bringing parents and teachers more in contact with each other, and eventually develop a greater sympathy and love between parents, teachers and pupils.

2. A History of the Progress of School Architecture and the Decoration of School Rooms in the City.

It is not generally known, and I presume that even some members of the Advisory Board for School Art Leagues are not aware, that fifty years ago the Education Department supplied architectural plans for the erection of school houses. The late Chief Superintendent of Education, the Rev. Dr. Ryerson, the founder of the public school system, whose memory we all revere, and whose name will be handed down to posterity as a great Canadian educationist, philanthropist and true Christian, was the first man in Canada to direct public attention to the importance of school architecture.

It was through his exertions that in 1850 Parliament voted the sum of £200 per annum for purchasing plans, engravings, etc., for the improvement of school architecture; these plans were published and distributed from time to time through the Upper Canada Journal of Education, and eventually school trustees made so many applications for specifications for erecting school buildings, that it became necessary for a book to be published on this subject.

In 1857 Dr. Hodgins, then Deputy Superintendent of Education, published under the authority of the Chief Superintendent, the "School House," its architecture, external and internal arrangements. This book was profusely illustrated with engravings of elevations and plans for school buildings, and was of great value in awakening an interest in school architecture, for as some of us remember, at that time we had a large number of log school houses, and the trustees of rural schools seemed satisfied that so long as they could afford shelter for the school children, they need make no attempt to make the school attractive to the pupils; they considered learning to be a good thing, and approved of children attending school, but they did not care about external architectural beauty, nor the external decoration of school rooms.

In 1859, two years after the publication of "The School House," the grant for school architecture was increased to $800.00 per annum.

In 1872 the Education Department offered prizes to Inspectors and Teachers for the best architectural designs and plans for rural school houses. Thirty persons competed, and seventeen awards were made to the value of $230.00; seven prizes were taken by school inspectors, and ten by school teachers.

In 1876 a new edition of the "School House," with illustrated papers on School Hygiene and and Ventilation, was published by Dr. Hodgins. I consider that a proper attention to Light, Heat and Ventilation is of more importance than external decorations in the construction of school buildings. If school rooms are not well ventilated and lighted, most injurious effects are produced on the mental development and physical health of children which are often felt in after life. It is a well known hygienic fact that if a child breathes foul air, he is in a state of physical discomfort; consequently in his undiscriminating mind the feelings of pain and lassitude are associated with school, and cause a dislike for books and study.

The ill health of pupils and teachers, sometimes credited to overwork, is frequently due to draughts and foul air in the school room.

Another important thing is the arrangement of light in the school room, we frequently find windows on the right of the desks of the pupils, and sometimes on three or four sides of a room; this together with the white walls. and interminable blackboards surrounding the children, no doubt produces Myopia or near sightedness; and how frequent it is that we now see school children using spectacles; fifty years ago such a thing was unknown.

In the same year 1876, the Education Department exhibited at the Centennial Exhibition models of school buildings for Collegiate Institutes, Public Schools in cities and towns also for Schools in rural districts, made to a working scale with ground plans and references as to cost of erection, accommodation, etc. At the close of the exhibition these models, which were much sought after by foreign educationists, were divided between the representatives of Japan and the United States. We also exhibited large

framed photographs of Collegiate Institutes, High Schools and Public Schools erected in different parts of this Province.

I may mention that a similar collection of large photographs for the Paris Exposition of 1900 is now being prepared under the authority of the Hon. Mr. Harcourt, Minister of Education.

In 1886, Dr. Hodgins, under the direction of the Hon. Adam Crooks, first Minister of Education, published "Hints and Suggestions on School Architecture and Hygiene," with plans and illustrations, and I may here state that the Education Department is now offering prizes for the best architectural plans for school houses.

In regard to the internal decoration of school houses I may say that from 1851 to to 1878 the Educational Depository supplied schools at half cost price with historical and and other prints and engravings, which were reproductions of the works of Raphael and other old masters, together with plain and colored engravings by Landseer and other modern painters, also small busts of eminent and celebrated men of ancient and modern times.

The annual reports of the Chief Superintendent and the Ministers of Education show that after good school houses had been erected, internal decoration was not uncommon. I claim, therefore, that the Education Department of this Province took the lead of all other countries in encouraging the decoration of public school walls with pictures, engravings, plaster casts, etc.

It was not until 1880 that France commenced the aesthetic culture of the pupils of common schools. In that year a commission of thirty eminent men were appointed to report on the decoration of schools, and art for schools, This commission was charged with the duty of studying the means of introducing into the system of instruction the aesthetic education of the eye. Its labors extended over a year. In the report it is said "The special task of this commission was to devise means and ways for improving aesthetic education through the eye, not by specific direct instruction set forth in programmes, but by the operation of the environments of the school, and the artistic character of its appliances. These environments and appliances were considered by the commission mainly under four heads: 1. The aesthetic character of the school building, including its artistic ornamentation, both exterior and interior; 2. The furnishing of objects of art for the observation and study of the pupils; 3. The reward of merits; 4. Illustrating apparatus."

Soon after this a Committee was appointed in Manchester, England, with similar functions to those of the French Commission. This was followed by the organization of an association with the same object in view, in London, England, with Mr. Ruskin as President.

In 1883, the Committee on Drawing of the Boston School Board called attention to what had been done in this direction in Manchester and London, and suggested the advisability of organizing a similar association for their schools. In this connection it remarks "we hold with the English Committee that a love for the beautiful is perhaps only second to religion as a protection against the grosser forms of self indulgence, and that it can best be kindled at an age when the mind is specially susceptible to the influence of habitual surroundings."

About the same time our present Premier, the Hon. Dr. Ross, then Minister of Education, introduced mural decoration in the school buildings under government control; the walls of the Toronto and Ottawa Normal Schools were either tinted or papered, and decorated with oil paintings, reproductions of the different ancient and modern Schools of Art, and life size busts of distinguished men of ancient and modern times, thus surrounding the teachers in training with examples of art, and studies of the great and good. The result which followed and will follow we cannot calculate, for we know that in human culture the most potential forces impressed on our minds are produced by our environments; that although these forces are imperceptible and scarcely seem to have existence, they cause an unconscious tuition, an invisible intangible influence on our minds, to which no resistence can be made because its very existence is unnoticed and unknown.

3. Historical Sketch, Showing the Importance of Art Education in Our Manufactures; also its Progress in this Province.

In 1850, when the grant for the erection of the Toronto Normal School was voted, one of the conditions was that rooms should be provided for a School of Art and Design; this was done, but the school was never established.

The Rev. Dr. Ryerson having seen from the results of the Universal Exhibition of 1851, that the Schools of Design in operation at that time where a failure, gave up the project of establishing a school of design, and instead thereof, with the consent of the Government, established the Provincial Educational Museum.

As I propose to show the importance of Art Education and the teaching of Drawing in our schools to manufactures, I may mention that in the beginning of the present century, Great Britain stood pre-eminent in her commerce and manufactures, and exported goods to every civilized country,—France, Germany and Denmark were desirous of getting a share of this trade, and their manufacturers encouraged Industrial Art so as to produce goods which were beautiful and pleasant to the eye.

In 1836 British manufacturers finding that they were losing a portion of their trade, appealed to the Board of Trade in London for assistance. The result was that finally nineteen Schools of Design were established, but this had no more effect in educating millions of people than a drop of water would have in filling a bucket. The grand climax came in 1851, at the first World's Exhibition, where British manufacturers found thousands of exhibits from other countries, superior in design to their own. What did they do? They did not sit down in despair, but like our brave soldiers in South Africa to-day who have met reverses from overwhelming numbers, with that sturdy perseverance, with that British pluck, determined to conquer or to die, so British manufacturers were resolved to overcome the brief success of other nations.

Soon after this schools for training teachers and mechanics were established and drawing was taught in every school receiving Government aid.

What was the result? I will tell you. Within five years after school pupils had been taught Industrial Drawing and Evening Classes were organized for teaching drawing to mechanics, a change came over the spirit of the dream. From 1848 to 1856 statistics show that France exported 10 per cent. more goods requiring industrial skill than Britain did. After 1856 the latter took the lead, and recent statistics show that Britain still exports far more industrial products than France.

It was only a few years ago that a Royal Commission was appointed to visit manufacturing cities in Europe and America, to ascertain whether the large sums of money expended for teaching industrial art should be discontinued. The huge report of the Royal Commissioners may be summed up in a single sentence. "If England discontinued her schools of art and practical science, that country would soon loose its prestige as a manufacturing nation," and I say without fear of contradiction that there is no other country in the world that has reaped such advantages from industrial art. By its means she has spread her domain, until that glorious old flag, the Union Jack, follows the sun around the globe, and Britain's commerce and manufactures are carried even beyond her conquest and colonial possessions.

I may remark, *en passant*, that at the great Exhibition of 1851, already referred to, Canada sent a fine collection of exhibits, representing our Mines, Forests and Fisheries, also a few exhibits of Agriculture and Manufactures, but I regret to say that any benefit which could have been derived from the exhibits which were intended to make known the great wealth of our country, was counteracted by the remarks made on our exhibits in the official Catalogue published under the authority of the Royal Commissioners, from which I will read you three extracts :—

1. "Exhibit, pair of snow shoes. These snow shoes are worn by all classes when travelling in the snow. Racing in them is a favorite amusement of both Canadians and Indians during the winter months; and so indispensable are they that without these shoes the poorer inhabitants would be confined in stormy weather to their homes.

2. "Exhibit, single sleigh with pole and shafts. This sleigh is generally drawn by four horses; sleighing forms the chief and most highly relished amusement of the Canadians during winter. To follow it, all business is suspended, and certainly a more invigorating exercise can scarcely be imagined. It is no uncommon thing to see a score or thirty of these sleighs at one time careering over the frozen snow in the fashionable drives.

3. "Exhibit, barrel of Indian meal. The agriculture of Canada is greatly influenced by the climate, and is necessarily of a peculiar character. During one-half of the year the surface of the country is covered with snow and ice, and thus remains totally unproductive. The farmer is consequently constrained to select such plants or variety of plants for his cultivation as will perfect their growth in the brief summer of the country. The agricultural produce of that colony is generally inferior in quality to that of more favored climates, and the wheat being nearly all spring sown does not command so high a rate in the market."

To return to my subject, I regret that I have not time to give you a description and show you the advantages derived by Canadians from the educational museum; I can only say that for many years it has been well attended and of great service to students.

Now in regard to the progress of Art Education in this Province In 1856, when the Educational Museum was opened to the public, drawing was placed on the teacher's programme for Public Schools, but was not made compulsory, and for the next twenty years little progress was made in this direction.

In the early part of the year 1876 the Hon. Adam Crooks, Minister of Education, directed me to issue a Circular to the Inspectors and Teachers in this Province, requesting them to send specimens of drawing to be exhibited at the Centennial Exhibition in Philadelphia; now you will be astonished when I tell you that although at that time we had 475.000 public school pupils, and large number of drawings were sent to the Department, only 70 were selected by the Committee on School work as worthy of being exhibited, 40 from Public School pupils and 30 from Model School pupils, and these were chiefly drawings of the Human Figure, Animals, Flowers and Landscapes, which are studies for Art Schools only.

This was an eventful year in regard to the art education of this Province, for although our educational exhibit as a whole was universally acknowledged to be superior to that of any other country, in drawing we were simply nowhere. The Minister at once saw the necessity of making drawing a more important part of our educational system. The Ontario School of Art in Toronto, which had just been established, was encouraged from time to time by Legislative grants to assist in developing industrial art. At first the progress in decorative art was very slow, but within the past few years has been very successful; some of the former students are now either proprietors or workmen in several large manufactories in Toronto, including lithography, engraving, decorative glass work, etc. New industries have been established and it has been proved that our trained mechanics in industrial art can successfully compete against the skilled workmen of other countries.

In 1878 the Education Department of Ontario made an exhibit in Paris; I was appointed Secretary for the Dominion, and soon after my arrival in Paris, on the recommendation of His Royal Highness the Prince of Wales, I was appointed Juror, representing Great Britain and Her Colonies in Class 8, Superior Education. In this Class we had 14 Jurors, 8 representing France, and 6 representing other countries.

Of course the educational exhibit from Ontario was very small; yet, notwithstanding that France occupied more space for her educational exhibits than all the combined space for the commercial exhibits from Great Britain and her colonies, France nor no other country which exhibited received a larger proportional share of awards and honors for education than the Education Department of Ontario.

In addition to awards of gold, silver and bronze medals and diplomas awarded to Ontario, the decoration of the Palm Leaf was conferred upon the Hon. Adam Crooks, the Rev. Dr. Ryerson, Dr. Hodgins and myself.

These academic honors were not conferred on representatives of Great Britain, nor any of her other colonies, and only two of these decorations were given to the United States.

I may mention that in the same manner as the Emperor Napoleon I. replaced the ancient order of St. Louis by the Cross of the Legion of Honor, he also replaced the ancient order of St. Michael by the Palm Leaves,

In addition, after I had been awarded the Gold Medal as collaborator in obtaining the grand prize for Canada for food products, the decoration of Chevalier of the Legion of Honor was conferred upon me.

In 1878 the London School of Art was established, and the late Mr. John Griffiths, who had been a decorative painter and designer in some of the largest china manufactures in England, introdnced China painting; his tuition was so successful that it developed a new trade in London, and for several years a considerable number of women and girls have earned a living by painting on china.

In 1882 the Ontario School of Art was removed to the Education Department, under the management of the Ontario Society of Artists, and myself as Superintendent. I was subsequently directed by the Minister to visit the Art Schools in the United States, and you will pardon me if I give an extract from the Report of the Minister of Education for 1882, in which I refer to the importance of teaching industrial drawing, when I say I consider that it will afford honourable and useful employment to women, and that many will avail themselves of these advantages, and perhaps to whom self-support may be necessary.

I can only say that my opinion in 1882 has proved to be correct, and I could if necessary give you many instances where ladies in reduced circumstances have been enabled to support their families by the knowledge of industrial drawing which they obtained in our Public and Art Schools.

I may here remark that great progress in Art Education was made in this Province during the administration of the late Hon. Adam Crooks, as Minister of Education.

In 1883, the Hon. Dr. Ross was appointed Minister of Education. At that time charges had been made against our Educational system, that the Education of our youth was not sufficiently practical, that it did not bear with sufficient directness on the occupations of the masses, that it did not secure for the workers, or bread-winners as good a training for industrial occupations as that afforded by Universities to students for professional life. As a far seeing and practical man Dr. Ross immediately seized upon the fact that as the value of drawing had already been recognized by those nations which had made the greatest progress in Industrial manufactures, it was necessary that drawing should be compulsory in our schools, but the first thing to be done was to train teachers for this work, therefore in 1883 the Minister provided free instruction in drawing during the summer holidays for teachers of High and Public Schools. The success was unprecedented, no less than 424 proficiency and 66 full teachers' certificates in the Primary Course were awarded.

In the following year 79 Teachers' Certificates and 177 Proficiency Certificates in the Primary Course, 2 Teachers' Certificates and 114 Proficiency Certificates in the Advanced Art Course were awarded tc the Teachers of our Province.

In 1885 Dr. Ross having succeeded in inducing Teachers to take more interest in the study of drawing, made drawing compulsory in our Schools, so that this very day we know that over 500,000 children in this Province, have been studying this important subject.

In 1886 I was appointed Commissioner of Education for the Colonial Exhibition, and we exhibited specimens of drawing from no less than 255,821 school pupils in addition we had 580 exhibits from Art Schools, Ladies' Colleges and other Institutions affiliated with the Education Department for examination purposes; these exhibits included Industrial Designs, Machine and Architectural Drawings, Modeling in Clay, Sculpture, Painting on China, and Oil and Water Colors, Drawing, etc. I am proud to say

that in this class no less than 237 Medals and Diplomas were awarded by the Royal Commissioners, which were presented by His Excellency the Governor-General, on 4th May, 1887.

The encomiums from educationists and the press, as to the excellence of our work were universal.

I will give one extract only for the purpose of showing you how much our industrial drawings were appreciated; the *Canadian Gazette* says: "The work from the Art Schools of Ontario is such as would do credit to many older countries. In view of the Exhibition the Ontario Manufacturers Association offered medals for the best designs for various manufacturing purposes, and Dr. May as Superintendent of Art Schools at once issued circulars to the schools notifying them to prepare forthwith various designs. The Toronto School designs were prepared for paper hanging; in Ottawa for iron work, such as railings, fences, etc.; in London designs for sideboards, etc.; and in the Kingston School for mantel pieces and over mantels. Considering then the fact that no selection is made in the exhibits of this class, all the competing designs been shown and that but a fortnight was allowed for the work, Ontario has reason to be proud of the result. It unquestionally forms a most important part of the court.

"Medals were also awarded to High and Public School pupils by leading manufacturers for designs for book-covers, carpets, oil cloths, etc. Those were all exhibited and were much admired by educationists and others."

Before leaving England, having received an intimation that Her Majesty the Queen would be pleased to accept a few specimens of Art School work from Ontario, I selected some exhibits from the different departments, and forwarded them with a letter referring to our advancement in the Industrial Art during the past few years, and the great interest H.R.H. the Princess Louise and the Marquess of Lorne had taken in the promotion of Art work during their residence in Canada.

In reply I received the following letter from General Sir Henry Ponsonby, Private Secretary to the Queen:—

OSBORNE, January 8th, 1887.

DEAR SIR,—The articles forwarded by you have arrived here to-day and I have given them to the Queen, who was very much pleased with them, and has commanded me to thank you for sending these well-executed specimens of the work of the students of the Art Schools, Education Department, Toronto.

I have the honor to be, Dear Sir,
Yours faithfully,

DR. S. PASSMORE MAY, C.L.H. HENRY F. PONSONBY.

I regret that for want of time I cannot on this occasion give you a description of our Educational Exhibits at the Chicago Exposition in 1893, but in order for you to form some opinion of our great success, I may state that, in addition to the large number of awards made to individual exhibitors in the Educational Court, the Education Department received fifteen awards for systems of training, etc., and seven awards for pupils' work in Provincial Schools and Institutions.

I will refer to three of these only:

1. General Education Exhibit.

Award:—For a system of public instruction almost ideal in the perfection of its details and the unity which binds together in one great whole all the schools from the Kindergarten to the University.

2. Educational Exhibit.

Award:—First, for excellent system of Kindergarten and Primary work prepared for the Public Schools; second, for excellent system of Primary, Secondary and Superior Instruction afforded all students throughout the Province.

2. Work of Students in Art Schools.

Award for artistic beauty and practical nature of the specimens.

I will now read you two extracts from the Toronto *Globe*, giving the opinions of two distinguished educationists representing Great Britain and the United States.

1. Sir Richard Webster on the Ontario Educational Exhibit.

World's Fair Grounds, Chigago, Sept. 27.—Sir Richard Webster, Chairman of the British Royal Commission to the World's Columbian Exposition, has been thoroughly exploring the fair during the past week. The distinguished British statesman, having completed the rounds of the exhibit courts of the different Provinces of the Dominion, was asked what he thought of their displays. Sir Richard unhesitatingly declared that he was astonished both as to the magnitude and perfection of most of the exhibits, but said what struck him most forcibly was the Ontario educational exhibit in the gallery of the Liberal Arts building. Further, he expressed the opinion that it was one of the most beautiful and instructive in the whole exhibition. He thought Ontario's the only exhibit that at all approached his ideal of what an educating exhibit should be, for he considered it the most perfect in arrangement, and explanatory in a simple and satisfactory way of the finest practical system of public education, from the kindergarten to the university, that the world affords to-day.

2. General Eaton, Ex-Commissioner of Education, United States.

"I was so much pleased with the wonderful exhibit of school appliances made by the Education Department of Ontario at the Centennial Exhibition in 1876, that I subsequently visited Toronto for the purpose of studying the school system, and examining the school apparatus, etc., in the Educational museum, my opinion of the excellence of both was so good that I am not the least surprised to find the exhibits from the Ontario Education Department second to none in the world."

In closing, I may remark that very few persons are aware of the commercial value of our present system of Industrial Art education in this Province, and you will be surprised when I tell you that our last census shows that within a decade our manufacturing establishments have increased 43 per cent., the number of employees 53 per cent., wages 88 per cent., and capital invested 249 per cent. And to the lovers of fine arts I may say that, in order to encourage native art, two years ago the Hon. Dr. Ross, Minister of Education, entered into an agreement with the Ontario Society of Artists to provide annually a collection of paintings to be exhibited in the Educational Museum, which the artists say in their Annual Report is much appreciated and of great benefit in promoting art culture in this Province, and W. E. Sherwood, A.R.C.A, in his article on the national aspect of Canadian Art, in Hopkins' Canada, an Encyclopœdia of the Century, says: "It is perhaps a sign of the real art-loving instincts of our people that we have such diverse institutions organized for art advancement, though many of these are of a sectional character and biassed by external influence, good may come out of them all. I must make a kindly reference here to the new Provincial Art Gallery in the Normal School. The Hon. Geo. W. Ross, Minister of Education, Dr. S. Passmore May, Superintendent of Art Schools, and the Hon. Richard Harcourt were largely instrumental in the erection of this Gallery. It is the intention to purchase the products of Canadian art only. So long as the selection of pictures is thus made by those who have the legal right to make them, so long will there be an open chance for the works of the native-born Canadian painter."

LITERARY AND SCIENTIFIC INSTITUTIONS.

1. *The Report of the Hamilton Literary and Scientific Association for the year ending 30th of April, 1899*, shows that seven general meetings and twenty-one sectional meetings were held, and twelve papers on Science, etc, were read and discussed.

Museum.—Numerous additions have been made to the museum, and collections of local fossils have been presented by the Association to the British and other museums also to several noted palæontologists.

There is an increased interest in the museum which is open free to the public once a week, particularly among young persons who are becoming interested in making their own collections, and can use the museum for reference and instruction.

The receipts including Government grant were $578.18, expenditure $430.33, balance on hand $147.85.

2. *The Report of the Kingston School of Mining for the year ending 30th of April, 1899*, shows that the total number of students registered for the session was 194 as follows: Mining engineering (degree course), 28; mining engineering (prospectors course), 6; other engineering courses, 6; veterinary science, bacteriology, dairy school for butter and cheese making and other subjects, 154.

In the laboratory of this School there were tested in 1898 specimens of ore gathered from different parts of Canada, of a weight varying from 500 lbs. to 7 tons.

At the Dairy School 7,344 lbs. of milk were received on the average each day.

Prospecting classes were conducted last summer in Parry Sound and Mattawa.

Expenditure, $16,385.00.

3. *The Report of the Ottawa Literary and Scientific Society for the year ending 30th April, 1899*, shows a membership of 319. Ten papers were read and discussed during the lecture course.

The transactions of the Society has been printed and forwarded gratuitously to nearly 200 societies throughout the world, and many valuable exchanges have been received and added to the library.

The Library and Reading Room have been very successful, 163 volumes and 28 bound volumes of magazines have been added to the library, and the total issue of books numbered 10,141, including history, biography, voyages and travels, fiction, general literature. poetry, theology, science, etc,

The Reading Room is well supplied with daily papers and the best English and American magazines and reviews. The expenditure for this branch of the Society was $168.40.

The receipts, including Government grant, were $1,122.55, expenditure $1,097.02, balance on hand $25.53.

4. *The Report of the Ontario Historical Society for the year ending 30th of April, 1899*, shows an increased interest in matters relating to this Province, the membership has been increased and a patriotic spirit developed as shown by an enthusiastic meeting in February when the following affiliated societies were represented, viz.: Belleville and Bay of Quinte Historical Society, Elgin Historical Society, Grenville Pioneer and Historical Society, Halton Historical Society, Lambton Historical Society, Lundy's Lane Historical Society, Niagara Historical Society, Niagara Falls U. E. Loyalists Association, Oxford Historical Society, Simcoe Pioneer and Historical Society, Women's Canadian Historical Society of Toronto, Women's Canadian Society of Ottawa, Women's Wentworth Historical Society, Wentworth Pioneer and Historical Society, Thorold and Beaverdam's Historical Society, York Pioneer and Historical Society.

A society has been recently organized in Picton for Prince Edward County and similar societies are being formed in other parts of the Province.

5. *The Report of the Institut Canadien Francais d'Ottawa for the year ending 30th of April, 1899*, shows that five courses of instruction were given during the session by eminent professors and other distinguished men:

1. Literary Course (including Canadian History and Literature).—These lectures were regularly attended by from four to five hundred members and other persons.

2. Course in Elocution.—This course had about the same total membership and average attendance as the Literary Course.

3 Course in Music —This course had an enrolled membership of 125, with an average attendance of 85. Almost within its members has been formed a Choral Society which fills an important position in the musical world of the capital.

4. Course in Industrial Electricity.—This course was under the direction of a practical expert who, aided by the necessary apparatus, gave experiments of great interest and value to a large number of mechanics representing various trades and manufacturers, also to the employees of electrical companies who were in regular attendance throughout the session.

5. Course in Needle-work.—This course was in charge of a committee of Ottawa ladies who were untiring in their efforts to impart instruction to the large number of members who availed themselves of the privilege of attending these classes.

Receipts, $2,182 75 ; expenditure, $2,499.31 ; balance due treasurer, $316.56.

6. *Report of the St. Patrick Literary and Scientific Association for the year ending 30th of April, 1899*, shows that $981.25 was expended for lectures and entertainments during the winter, which were largely attended. In addition, 135 members availed themselves of the privileges of the well-equipped library and reading-room. Books on the following subjects were loaned to members during the year, viz.: History, Biography, Voyages and Travels, Science and Art, General Literature, Poetry and the Drama, Religious Literature, Fiction and miscellaneous books. The library also contains 199 works of reference for the use of members.

Receipts, including balance on hand from previous year, $3,254.70; expenditure $1,300.22 ; balance on hand, $1,954.48.

7. *Report of the Ottawa Field Naturalists Club for the year ending 30th April, 1899*, shows that the club has been in existence 21 years; it has 250 members. The main object of the club is to interest lovers of science by conducting natural history excursions in the summer months, giving lectures and holding soirees with exhibitions of specimens and discussions thereon during the winter months, and the publication of the *Ottawa Naturalist*, the official organ of the club.

Three large excursions were held during the summer of 1898. The first was attended by 175 members. Addresses were given on the geology of the district, and interesting plants were collected in the neighbourhood. At the second excursion, collections on botany, geology and entomology were made, and addresses given by the leaders. The third excursion was attended by the Normal School students in a body under the guidance of the leaders of the different branches of the club.

Several sub-excursions were also held.

The winter course of lectures and soirees, which are practically meetings for the exhibition of specimens and discussions on the various topics of natural history, were very successful, being attended by representatives from the Normal School, the Collegiate Institute and other educational institutions.

The lectures were as follows :

Inaugural Address, Prof John Macoun.
Notes on some local violets, James M. Macoun.
Minerals of the Ottawa valley, Dr. R. W. Ellis.
Notes on an herbivorous Deinosaur from the Cretaceous of Western Canada, L. M. Lambe.
Some native Herbaceous Perennials worthy of cultivation, W. F. Macoun.
On the burrowing habits of the Cambaius, the Cray-fish, Dr. H. M. Ami.
Notes on Fresh-water Polyzoa, W. S. Odell.
Archæology of Lake Deschenes, T. W. E. Sowter.
Extra Limital Insects found at Ottawa, W. H. Harrington.
Life History of the Salmon, Prof. E. E. Prince.
Natural History in Art, Prof. J. Mavor.

Annual Conversazione and Microscopical Soiree which was attended by the Right Honourable the Earl of Minto, patron of the club.

The *Ottawa Naturalist*, under the editorship of Dr. H. M Ami, with a staff of associate editors, contains original papers from some of the leading scientists in Canada on the following subjects: Archæology, Zoology, Ornithology, Entomology, Botany, Geology, Chemistry, etc.

Receipts, $613.88; expenditure, $546.55; balance on hand, $67.33.

8. *Report of the Canadian Institute, Toronto, for the year ending 30th April, 1899*, shows that twenty-one ordinary meetings were held during the year at which twenty-nine papers were read, viz.: Geology 4, Mineralogy 3, Forestry 1, Astronomy 2, Biology 4, Archæology 2, Ethnology 2, Philology 1, History 3, Architecture 1, Miscellaneous 6.

The Biological section held eleven meetings, at which ten papers were read on Zoology, Ornithology, Entomology, Botany, etc.

Library.—During the year 2,084 exchanges have been received and 31 periodicals have been subscribed for and 254 volumes have been bound. The number of books and periodicals loaned during the year was 662.

In regard to membership the Council say "the record is most satisfactory" and forty-five names have been removed from the list for non-payment of fees.

The publications of the Institute during the year included part 2 of volume 5 of the transactions and four parts of volumes 1 and 2 of the proceedings.

The Memorial Volume is in course of preparation.

Receipts, $2,795.69; expenditure, $2,330.99; balance on hand, $464.70.

9. *The Report of the Astronomical and Physical Society of Toronto for the year ending 30th April, 1899*, shows that it has 3 life members, 13 honorary members, 20 corresponding members, 72 active members and 15 associate members.

Twenty-five meetings were held during the year at which a large number of papers were read and discussed, these are published in the Transactions of the Society for 1898, a large pamphlet with illustrations, containing 151 pages.

Receipts, $487.24; expenditure, $377.77; balance on hand, $109.47.

APPENDIX N.—*MEMBERS OF THE EDUCATIONAL COUNCIL AND BOARD OF EXAMINERS; LIST OF HIGH SCHOOL PRINCIPALS AND ASSISTANTS, 1900.*

THE HIGH SCHOOL AND UNIVERSITY MATRICULATION EXAMINATIONS.

1. MEMBERS OF THE EDUCATIONAL COUNCIL AND BOARD OF EXAMINERS FOR 1899-1900.

EDUCATIONAL COUNCIL.

Under the provisions of section 5, cap. 291, R.S.O., 1897, the following gentlemen were appointed members of the Educational Council:

James Loudon, M.A., LL.D, President of the University of Toronto.
Maurice Hutton, M.A., of Toronto University,
The Rev. N. Burwash, M.A., LL.D, Chancellor of Victoria University.
The Rev. William Clark, M.A., D.C.L., F.R.S.C., of Trinity University.
A. P. Knight, M.A., M.D., of Queen's University.
A. B. McCallum, B.A, Ph. D., University of Toronto.
J. H. Farmer, B.A., LL.D, of McMaster University.
Alfred Baker, M.A., of Toronto University.
The Rev. J. R. Teefy, M.A., LL.D., Principal of St. Michael's College.
W. Tytler, B.A., Public School Inspector, Guelph.
Cortez Fessenden, M.A, Principal of Collegiate Institute, Peterborough.
G. H. Armstrong, M.A., B. Paed, Principal of Borden St. Public School, Toronto.

W. PAKENHAM, B.A., R — JAMES LOUDON, M.A, LL.D. Chairman.

BOARD OF EXAMINERS APPOINTED BY THE EDUCATIONAL COUNCIL.

English, History and Geography:

W. J. Alexander, B.A, Ph.D.
O. P. Edgar, B.A., Ph.D.
A. E. Lang, B.A.

Mathematics:

A. C. McKay, B.A.
A. Odell.
W. Prendergast, B.A.

Classics:

A. J. Bell, M.A., Ph.D.
G. W. Johnston, B.A., Ph.D.
A. B. Nicholson, B.A.

French and German:

W. H. Fraser, B.A.
L. E. Horning, M.A., Ph.D.
A. H. Young, B.A.

Physics, Chemistry, and Biology:

R. R. Bensley, B.A.
W. L. Goodwin, D.Sc.
W. J. Loudon, B.A.

F. N. NUDEL, Secretary. — W. PAKENHAM, B.A., Chairman.

2.— List of Principals and Assistants of High Schools (Including Collegiate Institutes), January, 1900.

Collegiate Institutes.	Principals and Assistants. Name.	Degree.	Specialists.	Date of Appointment.	Salary. $ c.
Aylmer	Rutherford, Walter W	B.A., Tor.	Math.	1883	1,400 00
	Phelps, Frances G	B.A., Tor.	Eng. His. (Interim) Fr., Ger.	1896	700 00
	Brown, Lyman	B.A., Tor.	Class	1899	800 00
	Kilmer, Ernest E. C.		Sci. (Interim)	1899	800 00
Barrie	Redditt, Thomas H.	B.A., Tor.	Eng., His., Fr., Ger.	1893	1,500 00
	Hay, Andrew		Math.	1882	1,000 00
	Minns, James Edward	B.A., Vic.	Math., Sci.	1893	1,000 00
	Foucar, Walter K.	B.A., Tor.	Fr., Ger., (Interim) Eng., His.	1896	750 00
	Moir, M. Annie		Commercial (Interim)	1895	700 00
	Bennett, Charles V.	B.A., Queen's	Class	1897	800 00
Brantford	Burt, Arthur William	B.A., Tor.	Eng., Hist., Fr., Ger.	1893	1,800 00
	Passmore, Samuel F	M.A., Tor.	Class	1885	1,100 00
	Hoag, James P.	B.A., Queen's	Eng., Hist., Math.	1893	1,100 00
	Coates, Daniel Harsum	B.A., Tor.	Math.	1893	1,100 00
	Bunnell, Effie Maria	B.A., Tor.	Eng., Hist., Fr., Ger.	1891	1,000 00
	Hamilton, James Reid	B.A., Tor.	Sci	1893	1,100 00
	Shultis, Adam		Commercial	1896	1,000 00
Brockville	Marquis, Thomas G.	B.A., Queen's	Eng., Hist.	1897	1,500 00
	Copland, James Stuart	M.A., McMaster	Sci	1889	1,000 00
	Sidley, Henry R.	B.A., Trin.	Class	1895	1,000 00
	Husband, Almeron Judson	B.A., Tor.	Fr., Ger.	1895	950 00
	McGee, Cyril Haughton	B.A., Trin.	Math.	1897	1,000 00
	Giles, Edith			1890	650 00
	Richardson, Kate		Commercial (Interim)	1898	550 00
Chatham	Paterson, David Smith	B.A., Tor.	Eng., Hist., Fr., Ger.	1888	1,500 00
	Twohey, William J.	M.A., Tor.	Class	1885	1,200 00
	Taylor, Wilson	B.A., Tor.	Math.	1894	1,200 00
	Jewett, Albert E.	B.A., Queen's	Sci	1896	1,150 00
	Lane, James S. (Interim)	B.A., Tor.	Fr., Ger.	1898	850 00
	Black, James Spurgeon		Commercial	1894	950 00
	Mowbray William	B.A., Tor.	Eng., Hist. (Interim)	1899	750 00
Clinton	Houston, John	M.A., Tor.	Eng., Hist., Fr., Ger.	1892	1,225 40
	Rand, Wilfred Erl	B.A., Tor.	Math.	1892	950 00

	McLean, Ebenezer M		Sci	1894	900 00
	Treleavan, John Wesley	B.A., Tor	Class (Interim)	1895	850 00
	Parlee, Edith		Commercial (Interim)	1898	600 00
Cobourg	Mitchell, George Winter	M.A., Queen's	Class	1891	1,425 00
	Arthur, Colin Clayton	M.A., Queen's	Sci	1893	1,000 00
	Odell, John W	B.A., Tor	Math	1895	1,000 00
	Jones, Laura L	B.A., Tor	Eng., Hist., Fr., Ger	1898	900 00
	Mitchell, Jessie A	B.A., Tor		1896	700 00
Collingwood	Williams, William	B.A., Tor	Eng., Hist., Fr., Ger	1873	1,100 00
	Hammill, George	B.A., Tor	Math	1892	900 00
	Colling, John Knowles (Interim)	B.A., Tor	Class	1899	800 00
	Fraser, Charles McLean (Interim)	B.A., Tor	Sci	1898	600 00
	Simpson, Robert S. (Interim)		Commercial	1899	600 00
Galt	Carscadden, Thomas	M.A., Tor	Eng., Hist	1885	1,750 00
	Logan, Charles James	B.A., Trin	Class	1883	1,200 00
	Wright, Arthur Walker	B.A., Tor	Fr., Ger	1886	1,100 00
	DeGuerre, Ambrose	B.A., Tor	Math	1890	1,100 00
	Evans, William Edwin		Commercial	1892	850 00
	Hamilton, Robert S	B.A., Tor	Sci	1894	1,000 00
Goderich	Strang, Hugh Innis	B.A., Tor	Class	1871	1,300 00
	Moore, Alvin Joshua	B.A., Tor	Math	1880	950 00
	Charles, Henrietta	B.A., Tor	Eng., Hist., Fr., Ger	1890	1,000 00
	Grant, Burton D		Sci	1895	900 00
	McLellan, Kate			1895	700 00
Guelph	Davison, James	B.A., Vic	Math	1892	1,400 00
	Hill, Ethelbert, Lincoln	B.A., Tor	Sci	1889	1,000 00
	Skinner, Kate Clara	B.A., Tor	Eng., Hist., Fr., Ger	1895	800 00
	Wilson, Henry Ernest	B.A., Tor	Class	1895	950 00
	Charlesworth, John William			1888	800 00
	Dobbie, William James	M.A., Tor	Commercial	1892	800 00
Hamilton	Thompson, Robert Allen	B.A., Tor	Math	1886	1,800 00
	Turner, John Burgess	B.A., Queen's	Math., Sci	1885	1,400 00
	Paterson, Andrew	M.A., Trin		1874	1,200 00
	Crawford, John Thomas	B.A., Tor	Math	1889	1,200 00
	Logan, William McGregor	M.A., Tor	Class	1892	1,200 00
	Hogarth, Eber Septimus	B.A., Tor	Eng., Hist, Fr., Ger	1892	1,200 00
	MacPherson, Frederick Fotheringham	B.A., Tor	Eng., Hist., Fr., Ger	1894	1,200 00
	Gill, James	B.A., Tor	Math	1892	1,100 00
	Morgan, Sydney Albert	B.A., Tor., B. Paed	Class	1891	1,000 00
	Brown, Oliver Jenison	M.A., Vic		1881	1,000 00
	Davidson, Margaret Cheyne			1876	800 00
	Asman, Henry Oldrid Evison	B.A., London, Eng		1891	900 00
	Armstrong, William Gilnockie	M.A., Tor	Eng., Hist., Fr., Ger. (Inte'm)	1895	800 00
	Johnston, George Lang	B. A. Queen's	Commercial (Interim)	1888	800 00
	Morgan, Harriet Emma			1897	500 00

List of Principals and Assistants of High Schools (Including Collegiate Institutes), January, 1900.

Collegiate Institutes.	Principals and assistants. Name.	Degree.	Specialists.	Date of Appointment.	Salary.
					$ c
Ingersoll	Briden, William	B.A., Queen's	Class., Eng , Hist	1886	1,200 00
	Gundry, Arthur P		Sci.	1894	1,000 00
	McDonald, George L.	B.A., Tor	Eng , Hist., Fr., Ger.	1895	1,000 00
	Cameron, John Shaw		Math. (Interim)	1898	800 00
	Norman, Lambert	B.A., Tor	Eng., Hist., Fr., Ger	1997	800 00
ingston	Ellis, William Stewart	B.A., Vic	Math., Sci.	1893	1,800 00
	Sliter, Ernest Oscar	M.A., Tor	Class	1888	1,200 00
	Dales, John Nelson	M.A., Tor.	Eng., Hist., Fr., Ger	1889	1,200 00
	Marshall, John	M.A., Queen's	Eng , Hist	1897	1,200 00
	Lingwood, Frederick H,	M.A., Trin.	Class.	1894	800 00
	Sills, William Ryerson	M.A., Queen's	Math.	1897	1,100 00
	Sexton, James Henry		Sci. (Interim)	1898	800 00
	Ward, William		Commercial	1898	900 00
	Duff, James	M.A., Queen's	Eng., Hist., (Interim)	1899	600 00
	Hinch, Nicholas Edward.....(Interim)	B.A., Tor	Eng., Hist Fr, Ger.	1900	700 00
Lindsay	Harstone, John C.	B.A., Tor	Math.	1886	1,400 00
	Stevens, William H.	B.A., McGill.	Sci.	1889	1,100 00
	Hardy, Edwin A.	B.A., Tor.	Eng., Hist., Fr., Ger	1889	1,100 00
	Hillock, Julia Sine	B.A., Tor.	Fr., Ger.	1893	1,000 00
	Colling, James	B.A., Tor.	Class.	1894	1,100 00
	Muckle, Charles Park.....(Interim)	B.A., Tor.	Commercial, Math.	1899	800 00
London	Radcliffe, Samuel John	B.A., Tor.	Eng., Hist., Fr., Ger	1891	1,800 00
	Little, Robert A	B.A., Tor.	Class.	1886	1,250 00
	Gray, Robert A.	B.A., Tor.	Math.	1887	1,250 00
	Ferguson, William Chalmers	B.A., Tor.	Eng., Hist., Fr., Ger	1892	1,200 00
	McCool, John	M.A., Tor	Eng , Hist., Fr., Ger	1897	1,100 00
	McKee, George A.	B.A., Tor.	Class.	1897	1,050 00
	Govenlock, William M.	B.A., Tor.	Math.	1898	1,050 00
	McCready, Samuel B.	B.A., Tor.	Sci. (Interim)	1898	1,100 00
	Wilson, Nicholas			1866	1,050 00
	Andrus, Guy A.			1888	1,100 00
	Edwards, Clarence B			1894	1,075 00
	Riddell, Frank P.	B.A., Tor	Class	1898	950 00
	Jones, Samuel S			1892	1,000 00
	Horton, Charles W.	B.A., Queen's	Eng., Hist.	1895	1,000 00
	Dickinson, James A		Commercial	1895	1,000 00

	Voaden, Arthur		Commercial (Interim)	1898	950 00
	Downing, John Henry (Interim)			1900	900 00
	Hanson, Fannie M.			1886	800 00
	Kelso, Alice C.			1897	775 00
Morrisburg	Jamieson, James Smyth	M.A., Vic	Eng. Hist	1882	1,200 00
	Massey, Arthur Wallace	B.A., Vic	Eng., Hist., Math	1892	850 00
	Kirkland, William Stuart		Sci (Interim)	1898	800 00
	Albarus, Hedwig Selma	B.A., Tor	Fr., Ger	1899	700 00
	Croskery, Robert Arthur (Interim)	B.A., Queen's	Class	1899	700 00
	Taylor, Luther William (Interim)		Commercial	1899	600 00
Napanee	Henry, Thomas McKee	B.A., Tor	Math	1890	1,400 00
	French, Frederick William	B.A., Tor	Class	1894	1,000 00
	Selwood, Frederick Shelton	B A., Tor	Sci	1898	900 00
	VanEvery, John Fair	B.A., Tor	Eng., Hist., Fr., Ger	1897	800 00
	Nichol, Margaret A			1892	600 00
	Smith, Margaret			1892	600 00
Niagara Falls	Dickson, James Dickson	B.A., Tor	Math	1893	1,300 00
	Walker, David M.		Commercial	1893	1,000 00
	Currie, Peter W.	B.A., Tor	Sci	1894	800 00
	DeBeauregard, Ester T.	B A., Tor	Eng., Hist., Fr., Ger	1896	750 00
	Tasker, Lawrence Herman	M.A , Tor	Class	1898	1,000 00
Ottawa	Macmillan, John	B.A., Tor	Eng., Hist	1881	2,400 00
	Jolliffe, Orion John	M.A., Vic	Class	1884	1,700 00
	McDougall, Alexander Hiram	B.A., Tor	Math	1889	1,700 00
	Alexander, Luther Herbert	M.A., Tor	Eng., Hist., Fr., Ger	1894	1,450 00
	Sykes, Wm. John	B.A., Vic	Eng., Hist	1894	1,450 00
	Stothers, Robert	B.A., Queen's		1887	1,200 00
	Norris, Isaac Taylor	B.A., Queen's	Math	1898	750 00
	Conklin, James Davidson		Commercial	1894	1,150 00
	Campbell, Daniel A	B.A., Tor	Sci (Interim)	1896	1,150 00
	Graham, Wm. Andrew	B.A., Tor		1895	900 00
	Scott, Bessie Mabel			1892	800 00
	Macmillan, Herbert S.	B.A., Tor	Fr., Ger	1897	800 00
Owen Sound	Jenkins, Wm. H.	B.A., Tor	Sci	1890	1,600 00
	Packham, James Henry	B.A., Vic	Math., Commercial	1884	1,100 00
	Murray, Thomas	B.A., Tor	Math	1897	1,100 00
	McKellar, Herbert S.	B.A., Tor	Fr., Ger	1898	1,000 00
	Brough, Thomas Allardyce	B.A., Queen's	Eng., Hist	1893	1,100 00
	Burgess, Herbert H:	B.A., Queen's	Eng., Hist	1891	1,100 00
	Shields, Alfred J			1894	700 00
	Jolliffe, Richard Oralondo (Interim)	B.A., Tor	Class	1899	1,000 00
Perth	Hardie, William	B.A., Tor	Class	1892	1,200 00
	Woods, Emma Orilla	B.A., Vic	Eng., Hist., Fr., Ger	1890	850 00
	Edmiston, James Alfred			1893	800 00
	Rosevear, Howard Stanley	B.A.Tor.A.M.Harv	Sci	1898	900 00

List of Principals and Assistants of High Schools (Including Collegiate Institutes), January 1900.

Collegiate Institutes.	Principals and assistants. Name.	Degree.	Specialists.	Date of appointment.	Salary. $ c.
Perth	Doxsee, William Morley	B.A., Vic.	Math.	1899	900 00
Peterborough	Fessenden, Cortez	M.A., Trin.	Math.	1890	2,000 00
	Fife, James A	B.A., Tor.	Math., Sci.	1887	1,200 00
	Jeffries, John	B.A., Tor.	Eng, Hist., Fr., Ger.	1889	1,200 00
	Kenner; Henry R. H	B.A., Tor.	Class.	1893	1,160 00
	McPherson, Angus William	B.A., Tor.		1899	650 00
	Fife, Mary H. A. (Interim)	B.A., Tor.		1899	550 00
	O'Brien, Michael			1892	1,000 00
Ridgetown	Little, John George	B.A., Tor.	Math	1889	1,300 00
	Smith, James Harvey	M.A., Queen's	Sci.	1888	1,000 00
	Reid, Robert	B.A., Tor.	Eng., Hist., Fr., Ger.	1894	800 00
	Marshall, John Wells (Interim)	B.A., Queen's	Class	1899	700 00
	Keillor, James			1891	650 00
Sarnia	Grant, David M	B.A., Tor.	Class.	1885	1,300 00
	Corbett, Louis C	B.A., Tor.	Eng., Hist., Fr., Ger.	1891	1,100 00
	Corkhill, Edward James	B.A., Queen's	Sci.	1891	1,000 00
	Campbell, Alexander	B.A., Tor	Math	1890	1,000 00
	Pottinger, Sylvia V.			1875	750 00
Seaforth	Clarkson, Charles	B.A., Tor	Eng., Hist., Math.: Sci	1887	1,200 00
	Robertson, Hugh S	B.A., Tor	Math.	1895	1,000 00
	Stone, Samuel George	B.A., Tor	Class.	1897	900 00
	Cheswright, Richard C		Sci.	1893	925 00
	Kirkman, Barbara		Fr., Ger.	1884	725 00
Stratford	Mayberry, Charles Alexander	B.A., LL,B., Tor.	Class.	1891	1,500 00
	Cornwell, Leslie J	B.A., Tor	Math.	1893	1,100 00
	Mills, George K.	B.A., Tor	Sci.	1895	1,000 00
	Libby, Walter	B.A., Vic	Eng., Hist., Fr., Ger.	1897	1,000 00
	Malcolm George	B.A., Queen's		1890	950 00
	Fletcher, Willliam Hugh		Commercial	1899	900 00
	Marty, Sophie E	M.A., Queen's	Eng., Hist:, Fr., Ger.	1900	900 00
Strathroy	Wetherell, James Elgin	B.A., Tor	Class., Eng., Hist.	1883	1,500 00
	Patterson, Richard Allan	B.A., Tor	Math	1898	1,000 00

Strathroy	Cook, Margaret	M.A., Tor	Eng., Hist., Fr., Ger	1895	900 00
	Reynolds, Aaron Kilbourne		Sci.	1889	900 00
	Kent, Eleanor		Commercial (Interim)	1899	700 00
St. Catharines	Henderson, John	M.A., Tor	Class., Eng., Hist.	1872	1,600 00
	Robertson, William John	B.A., Tor. LL.B., Vic	Math	1874	1,200 00
	Giffin, James A	B.A., LL.B., Tor	Sci	1894	1,100 00
	Cloney, Sarah Louisa	M.A., Queen's	Eng., Hist., Fr., Ger.	1896	900 00
	Laing, Arthur Stewart.....(Interim).		Commercial	1889	900 00
	Stevenson, William John		Eng., Hist.	1892	700 00
	Caverhill, Arthur E.			1894	700 00
St. Mary's	Martin, Stephen	B.A., Tor	Math	1886	1,200 00
	Follick, Thomas Henry	B.A., Vic	Sci	1885	900 00
	Clayton, Adelaide Helena R	B.A., Tor	Eng., His., Fr., Ger	1892	850 00
	Glassey, David A	B.A., Tor	Class	1894	900 00
	Wightman, Robert.....(Interim)	B.A., Tor	Math	1897	600 00
St. Thomas	Quance, Noah	B.A., Tor	Class	1891	1,500 00
	McGeary, John Henry	M.A., Tor	Math	1888	1,200 00
	Stevenson, Orlando John	M.A., Tor	Eng., Hist., Fr., Ger	1897	1,100 00
	Marty, Aletta Elise	M.A., Queen's	Fr., Ger	1894	1,200 00
	Lees, Richard	M.A., Queen's	Sci	1894	1,200 00
	Johnson, Robert Wilbur .....(Interim)			1898	700 00
	Meiklejohn, Allen James..... (Interim)	B.A., Queen's	Eng., Hist.	1899	600 00
Toronto (Harbord st.)	Spotton, Henry Byron	M.A., Tor	Class., Sci	1891	2,500 00
	Hagarty, Edward William	B.A., Tor	Class	1891	1,500 00
	Balmer, Eliza May	B.A., Tor	Eng., Hist., Fr., Ger.	1891	1,500 00
	Lawler, Gertrude	M.A., Tor	Eng., Hist., Fr., Ger., Math.	1891	1,500 00
	Smyth, Thomas H.	M.A., Tor	Sci	1891	1,500 00
	Cox, John Loane	B.A., Tor	Math	1892	1,500 00
	Eldon, Robert Henry		Math. Commercial	1891	1,500 00
	Forfar, Charles	B.A., Tor	Eng., Hist., Fr., Ger.	1892	1,200 00
	Kennedy, Lyman Aaron	M.A., Vic		1892	1,200 00
	Strath, Robert Smith	B.A., Tor	Math	1893	1,200 00
	Clark, Luther J	B.A., Queen's		1896	1,050 00
	Carstairs, John Stewart	B.A., Tor	Eng., Hist. (Interim)	1899	1,000 00
Toronto (Jameson ave.)	Embree, Luther Edmund	M.A., Tor	Class., Eng., Hist., Fr., Ger.	1888	2,500 00
	Smith, Gilbert Acheson	B.A., Tor	Sci	1889	1,500 00
	Ryckman, Louise L	B.A., Tor	Class., Eng., Hist., Fr., Ger.	1891	1,500 00
	Birchard, Isaac J	M.A., Tor	Math	1893	1,500 00
	Crawford, Henry J.	B.A., Tor	Class	1894	1,500 00
	M llar, James			1888	1,500 00
	Wisner, John Anderson	M.A., Trin	Commercial	1889	1,500 00
	Spence, Nellie	B.A., Tor	Class., Eng., Hist.	1889	1,250 00
	Sinclair, John	B.A., Tor		1898	1,100 00
Toronto (Jarvis st.)	MacMurchy, Archibald	M.A., Tor	Math	1872	2,500 00

Collegiate Institutes.	Principals and assistants. Name.	Degree.	Specialists.	Date of Appointment.	Salary.
					$ c.
Toronto (Jarvis st.)	Chase, George A	B.A., Tor	Eng., Hist., Fr., Ger	1889	1,500 00
	Mauley, Frederick Fitzpayne	M.A., Tor	Math	1875	1,700 00
	Shaw, George Edmund	B.A., Tor	Eng., Hist., Fr., Ger	1876	1,500 00
	Grant, Wilbur		Math	1881	1,500 00
	Michell, William C	B.A., Tor	Class	1897	1,100 00
	Crawford, William Glover	B.A., Tor	Class	1872	1,500 00
	McEachren, Neil	B.A., Tor	Sci	1886	1,500 00
	MacMurchy, Helen			1880	900 00
	Thomas, Janie	B.A., Tor	Eng., Hist. (Interim)	1882	900 00
	Lehmann, Carl (Interim)	B.A., Tor		1898	1,050 00
Whitby	Hogarth, George Henry	B.A., Tor	Math	1890	1,100 00
	Henderson, Anson G		Commercial	1881	960 00
	Jones, George M	B.A., Tor	Eng., Hist., Fr., Ger.	1896	700 00
	Dent, William A		Sci	1896	750 00
	Tamblyn, W. F (Interim)	B.A., Tor,, Ph. D. Col	Class	1899	750 00
Windsor	Cody, William Stephen	B.A., Tor	Math	1893	1,500 00
	Gavin, Frederick P	B.A., Queen's	Sci	1892	1,000 00
	Bell, Frederick Henry	B.A., Tor	Eng., Hist., Fr., Ger	1898	900 00
	McVicar, Archibald	B.A., Tor	Eng., Hist	1898	800 00
	Messmore, James L	B.A., Tor	Class	1899	800 00
	Symington, Marion			1895	700 00
	Neilson, James		Commercial	1898	900 00
Woodstock	Levan, Isaac Master	B.A., Tor	Class., Eng., Hist., Fr., Ger.	1898	1,500 00
	Griffin, Albert Dyke		Math	1882	1,100 00
	Kerr, Charles Staple	B.A., Tor	Eng., Hist. (Interim) Class.	1889	1,000 00
	Stevenson, Andrew	B.A., Tor	Eng., Hist	1896	1,000 00
	Cole, James McLarty		Sci	1898	1,000 00
	Srigley, Edward Cooper		Commercial	1895	750 00
	Errett, Charles Francis			1897	700 00
High Schools.					
Alexandria	McKay, Donald	B,A., Tor	Class	1895	1,250 00

	Longmore, H. Bruce.....(Interim)	B.A., Queen's		1898	750 00
	O'Brien, Lizzie			1896	650 00
Almonte	McGregor, Peter Campbell	B.A., Queen's	Class	1882	1,100 00
	McPhail, Alexander C	B.A., Queen's		1899	750 00
	Armour, Amy A		Fr., Ger. (Interim)	1893	723 00
	Thompson, Margaret Jane	B.A., Queen's	Fr., Ger. (Interim) Eng., Hist	1895	695 00
Arnprior	Morrow, Archibald Elston	B.A., Tor	Class	1898	1,000 00
	Rudlen, William George (Interim)	B.A., Tor	Math	1898	700 00
	Day, Alfred Ernest.....(Interim)	M.A., Queen's	Fr., Ger	1898	625 00
Arthur	Snider, E. Egerton	B.A., Vic	Math	1896	1,050 00
	Race, Cecil E.....(Interim)	B.A., Tor	Math	1899	600 00
	Elder, William J.....(Interim)	B.A., Tor		1899	450 00
Athens	Massey, Norman Levi	B.A., Vic	Math	1898	900 00
	Bishop, Charles Peter			1895	650 00
	Dowsley, William Clinton (Interim)	M.A., Queen's	Class., Hist., Eng.	1899	600 00
	Moore, James Rossington .....(Interim)	M.A., Queen's	Sci	1899	500 00
Aurora	Mulloy, Charles W	B.A., Tor	Class	1896	1,000 00
	Rice, John			1895	650 00
	Mills, Martha Christine.....(Interim)	B.A., Queen's	Fr. Ger	1898	500 00
Beamsville	Myer, Albert Nicholas	M.A., Trin	Math. (Interim)	1898	800 00
	Ball, Kathleen Hester			1892	550 00
Belleville	Milburn, Edward Fairfax	B.A., Trin		1893	1,200 00
	Knight, William W		Math	1892	900 00
	Clarke, Henry Jellyman		Sci	1892	850 00
	McRae, Jesse Carre			1889	600 00
	Lutton, James T.....(Interim)	B.A., Tor	Class	1898	800 00
Berlin	Connor, James William	B.A., Tor	Class., Eng., Hist	1870	1,300 00
	Forsyth, David	B.A., Tor	Math	1876	1,100 00
	Sheppard, Frederick William		Eng., Hist	1888	900 00
	Eby, Minnie Dorothy	M.A., McMaster		1898	600 00
Bowmanville	Gilfillan, James	B.A., Queen's	Sci	1897	1,100 00
	Tamblyn, William Ware	M.A., Tor	Class., Eng., Hist., Fr., Ger.	1897	900 00
	Frost, Francis H	B.A., Tor	Math	1896	800 00
	Bragg, Thomas George	B.A., Tor	Class., Fr., Ger	1897	800 00
Bradford	Rogers, James C.	B. A., Queen's	Eng., Hist., Fr., Ger.	1896	1,000 00
	McLean, Allan			1892	700 00
	Burgess, John A			1895	650 00
Brampton	Fenton, William J	B.A., Tor	Class	1894	1,200 00
	Galbraith, William John	B.A., Trin	Fr., Ger	1887	900 00

List of Principals and Assistants of High Schools (Including Collegiate Institutes) January, 1900.

High Schools.	Principals and assistants.			Date of appointment.	Salary.
	Name.	Degree.	Specialists.		$ c.
Brampton	Howard, Edwy S.	B.A., Vic.	Eng., Hist.	1892	900 00
	Warren, James M.	B.A., Tor.	Math.	1897	900 00
	Cosens, Absalom	B.A., Tor.	Sci.	1897	700 00
Brighton	Newman, George E.	B.A., Queen's	Fr., Ger. (Intr'm) Eng. Hist.	1896	900 00
	Burke, Alexander			1894	700 00
Caledonia	McRitchie, Alexander Robinson	B.A., Tor.	Sci.	1897	900 00
	Aubin, Alfred Lerrier	B.A., Oxon.	Class.	1896	700 00
	Colling, George F. (Interim)	B.A., Tor.	Math.	1899	650 00
Campbellford	Shields, Alexander M.	B.A., Tor.	Eng., Hist.	1889	1,100 00
	Hume, John P.	B.A., Queen's		1896	900 00
	Boyes, Robert		Math.	1895	800 00
	Stewart, Ernest J. (Interim)	B.A., Queen's		1899	500 00
Carleton Place	Patterson, William John	M.A., Queen's	Math.	1892	1,100 00
	McIntosh, William Daniel	B.A., Queen's	Eng., Hist.	1895	800 00
	McDonald, Neil			1891	700 00
	McNeeley, Lizzie (Interim)	B.A., Tor.	Eng., Hist	1897	600 00
Cayuga	Skeele, James Eton	B.A., Tor.		1897	950 00
	Seaton, Edward T.	B.A., Queen's.	Math.	1897	800 00
	French, Bruce (Interim)	B.A., Tor.		1899	500 00
Colborne	Bellamy, W.	B.A., Vic.		1890	925 00
	Foik, Henry J.			1894	600 00
Cornwall	Knight, Adolphus Gustavus	B.A. Vic.	Class., Eng., Hist.	1897	1,300 00
	Nugent, James.			1884	900 00
	Fitzgerald, Eliza Sophia	B.A., Queen's.	Class.	1899	1,100 00
	McLean, Allan Edmund	B.A., Queen's.		1898	800 00
	Birchard, Alexander Fraser			1898	650 00
Deseronto	Smellie, W. K. T	B.A., Tor.	Sci.	1896	1,100 00

	Whyte, Robert	B.A., Tor.		1896	750 00
	Gundy, Henry Wentworth (Interim)	B.A., Tor.	Class	1899	550 00
Dundas	Reid, Joseph	M.A., LL.B., Tor.	Class	1894	1,200 00
	Hill, Richard J.			1892	850 00
	Panton, Agnes Wilkie			1892	550 00
Dunnville	Cooke, John A.	B.A., Queen's	Class	1896	900 00
	Waines, William L. (Interim)		Class	1899	725 00
	Robertson, George D.			1893	600 00
	Reid, M. Ryckman (Interim)	M.A., Queen's	Sci.	1899	550 00
Dutton	Payne, John Charles	B.A., Tor.		1896	850 00
	Taylor, John Andrew (Interim)	B.A., Queen's	Sci.	1898	650 00
	Anglin, Robert W. (Interim)	M.A., Queen's	Math.	1898	550 00
	McLennan, Alexander L. (Interim)	B.A., Queen's		1900	.....
Elora	McMurchy, Norman	B.A., Tor.	Sci.	1895	1,000 00
	Carter, Janet Wishart	M.A., Tor.	Fr., Ger.	1893	600 00
	Durnin, George A. (Interim)			1898	600 00
Essex	Crassweller, Christopher L.	B.A., Tor.	Math.	1888	1,150 00
	Keith, George Walter (Interim)	B.A., Tor.	Math.	1898	650 00
	Kirkwood, Florence Ethel (Interim)	B.A., Tor.	Class	1899	650 00
Fergus	Perry, Peter	M.A., Trin.	Class	1889	1,000 00
	Campbell, Archibald L.			1894	750 00
	Rowsome, Alice Gertrude	B.A., Tor.	Fr., Gr.	1896	500 00
Forest	Preston, Thomas	B.A., Tor.		1897	800 00
	Dandy, William Percy	B.A., Tor.	Commercial (Inter'm)	1897	650 00
	Tennant, Adelaide Emma (Interim)	B.A., Tor.	Eng., Hist., Fr., Gr.	1898	540 00
Gananoque	Graham, Robert George	B.A., Vic.	Math.	1894	1,100 00
	McPherson, Walter E.	B.A., Tor.	Eng., Hist., Fr., Ger.	1897	800 00
	Wilson, W. Asbury (Interim)	B.A., Queen's		1899	500 00
Georgetown	Coutts, Richard David	B.A., Tor.	Class	1897	1,000 00
	Hutt, Janet M.			1894	600 00
	Wetherald, Hubert M. (Interim)			1897	600 00
Glencoe	Morrow, John Duncanson	B.A., Tor.	Class	1898	850 00
	Taylor, John Gladstone (Interim)	B.A., Tor.	Math.	1900	600 00
	Weekes, Edith Annie			1896	450 00
	Allin, Elizabeth (Interim)	B.A., Tor.	Fr., Gr.	1899	500 00
Gravenhurst	Muldrew, William H.	B.A., Queen's: D. Pæd.	Math., Sci.	1894	1,000 00
	Patterson, Ruth	B.A., Tor.		1898	500 00
Grimsby	Harrison, Charles W.	M.A., Vic.		1894	800 00
	Strang, Rose Innis			1899	500 00

High Schools.	Principals and assistants.			Date of appointment.	Salary.
	Name.	Degree.	Specialists.		$ c.
Hagarsville	Macnicol, James	B.A., Tor		1892	950 00
	Kaiser, Jesse B			1891	750 00
	Wright, Robert			1896	600 00
Harriston	McMurchie, James	B.A., Tor	Math	1881	1,200 00
	Leibner, Ernest		Sci	1895	740 00
	Martin, William (Interim)	B.A., Tor	Class	1899	600 00
	Nichols, Bessie H. (Interim)	B.A., Tor	Eng., Hist., Fr., Gr	1900	400 00
Hawkesbury	Shotwell, William	B.A., Tor	Fr., Ger (Interim)	1897	1,000 00
	Wright, William George			1896	650 00
	Higginson, Maria Adelaide			1897	475 00
Iroquois	Jackson, Joseph A	B.A., Vic		1893	1,000 00
	Stanley, Thomas E. A	B.A., Tor	Math	1897	825 00
	Whyte, David (Interim)	B.A., Tor	Sci	1899	700 00
	Rose, Nellie		Fr., Ger	1898	550 00
Kemptville	Dillane, William	B.A., Tor		1895	1,050 00
	Nelson, John	B.A., Queen's	Math	1896	650 00
	Emery, John W		Sci	1895	650 00
	Smith, Alexander William (Interim)	B.A., Tor		1900	600 00
Kincardine	Perry, Samuel Walter	B.A., Vic	Class	1890	1,200 00
	Gray, James	M.A., Tor		1890	700 00
	Norris, James	M.A., Queen's	Math	1894	900 00
	Ashwell, Annie Eliza (Interim)	B.A., Tor	Eng., Fr., Ger	1899	600 00
Leamington	Elliott, John	B.A., Queen's	Eng., Hist., Math	1896	1,100 00
	Bonis, Harry	B.A., Tor	Class	1899	700 00
	Scratch, Lennie M		Sci	1896	650 00
	Weidenhammer, Frederick J	B.A., Tor	Fr., Ger (Interim)	1897	650 00
Listowel	Phillips, William Alexander	B.A., Tor	Eng, Hist., Fr., Ger	1892	1,000 00
	Nichol, William Wallace (Interim)	B.A., Tor	Math	1898	750 00
	Stoddart, Robert	B.A., Tor	Class (Interim)	1898	650 00

Lucan	Stuart, Frederick Alfred	B.A., Tor	Sci	1897	1,000 00
	Tier, William	M.A., Tor	Math	1896	750 00
	Burnham, Archibald Mowbray.....(Interim)	B.A., Tor	Eng., Hist., Fr., Ger	1900	600 00
Madoc	Watson, Alexander H	B.A., Tor		1889	1,100 00
	Ivey, Thomas J	M.A., Tor	Sci	1896	750 00
Markham	Reed, George Henry	B.A., Tor.: B. Pæd.	Class	1890	1,000 00
	Maclean, Godwin	M.A., Tor.	Math	1899	600 00
	Annis, Mary	B.A., Tor	Fr., Ger .....(Interim)	1895	525 00
	Miller, Nannie, M. A		Eng., Hist	1894	475 00
	Steer, Albert B	B.A., Tor		1899	500 00
Meaford	Mowat, Alexander	B.A., Tor		1892	1,100 00
	Huff, Samuel		Sci	1891	750 00
	Dundas, Arthur A	B.A., Tor		1897	650 00
	Dingle Grace Keam	B.A., Tor	Eng., Hist.. Fr., Ger	1900	500 00
Mitchell	Elliot, William	B.A , Tor	Math	1882	1,050 00
	Fry, Frank De Witt	B.A., Tor	Eng.,Hist.,Fr.,Ger.(Int'r'm)	1895	850 00
	May, William F			1895	750 00
Mount Forest	Brethour, John Henry	B.A., Vic	Class	1891	1,100 00
	Pearson, Alexander	B.A., Tor		1895	725 00
	McCutcheon, Frederick William Caswell	B.A., Tor	Math., Eng., Hist	1897	725 00
	Clapp, Florence H.....(Interim)			1900	300 00
Newburgh	Nesbit, David Ashton	B.A., Queen's		1893	1,000 00
	Brown, Percy W		Sci .....(Interim)	1898	550 00
	Denyes, James Malcolm.....(Interim)	B.A., Queen's		1898	550 00
Newcastle	Davidson, Hugh	B.A., Tor		1886	825 00
	Cathro, Elizabeth Don			1898	400 00
Newmarket	Coombs, Ernest	M.A., Tor.: B. Pæd.	Class	1889	1,000 00
	Hollingshead, John Edwin			1884	700 00
	Starr, Hannah Jane .....(Interim)			1898	450 00
Niagara	Ireland, William W	B.A., Mtba	Math	1898	800 00
	Carnochan, Janet			1878	450 00
Niagara Falls South	Sherin, Frederick	M.A., Vic	Math	1894	1,000 00
	McManus, Emily	M.A., Queen's	Eng., Hist	1895	600 00
	Martin, John Moore	B.A., Tor	Sci	1899	600 00
Norwood	Davidson, John	M.A., LL.B., Vic.	Class	1882	1,100 00
	Graham, Peter Edwin..... (Interim)	B.A., Queen's	Fr., Ger	1899	600 00
	Merritt, Robert Morris.....(Interim)	B.A., Tor	Math	1899	600 00
Oakville	Wellwood, Nesbitt John	B.A., Tor	Math	1877	1,050 00
	Lusk, Charles Horace			1870	750 00

High Schools.	Principals and assistants.			Date of appointment.	Salary.
	Name.	Degree.	Specialists.		
					$ c.
Omemee	Jardine, William Wilson	B.A., Tor		1897	800 00
	Morgan, John James	B.A., Vic	Sci	1896	600 00
Orangeville	Steele, Alexander	B.A., Tor	Eng., Hist., Math	1879	1,400 00
	Jenkins, Robert Smith	M.A., Tor	Class, Fr. Ger	1894	800 00
	Lee, Samuel Carson	B.A., Trin	Sci. (Interim)	1897	700 00
	Clarke, Frederick Hall	B.A., Tor	Eng., Hist., Fr., Ger. (Int'rm)	1895	700 00
	McBride, Frederick N. (Interim)			1899	400 00
Orillia	Dickson, John Elder	B.A., Tor	Class., Eng., Hist	1899	1,200 00
	Rogers, George Franklin	B.A., Vic	Sci	1894	800 00
	Doidge, Thomas Clarke	B.A., Tor	Math, Com. (Interim)	1899	800 00
	Langrill, Adelaide Jane (Interim)	B.A., Tor	Eng., Hist., Fr. Ger	1899	600 00
	Beaton, Kate Florence (Interim)	B.A., Queen's		1899	600 00
Oshawa	Smith, Lyman C	B.A., Vic	Class., Eng., Hist.	1882	1,300 00
	Slemon, Edward T	B.A., Vic	Math	1892	950 00
	Riddell, Agnes Rutherford (Interim)	M.A., Tor	Eng., Hist., Fr., Ger	1898	600 00
	Panton, Jessie R			1886	650 00
	Kinver, Maggie M			1895	500 00
Paris	Bell, Walter N	B.A., Tor	Class	1898	1,200 00
	Armstrong, George H			1875	900 00
	Wilson, Thomas Matheson (Interim)	B.A., Tor	Sci	1898	700 00
Parkhill	McDougall, Neil	B.A., Tor	Sci. (Interim)	1897	800 00
	Libby, Minnie Fennessy	B.A., Vic	Eng., Hist	1895	600 00
	McKinley, James Mathew (Interim)	B.A., Tor		1899	550 00
Pembroke	Ross, Ralph	B.A., Tor	Class	1895	1,100 00
	Standing, Thomas W	B.A., Tor	Math	1895	800 00
	Shirreff, Robert Marshall		Fr., Ger. (Interim)	1895	750 00
	Miller, May			1895	600 00
Petrolea	Bell, John Johnstone	B.A., Tor		1888	1,200 00
	Clyde, William	M.A., Queen's		1888	1,050 00
	Montgomery, William	B.A., Tor	Math	1889	900 00

	Brown, Harry W.	B.A., Tor.	Eng., Hist., Fr., Ger. (Intr'm)	1894	850 00
Picton	Dobson, Robert	B.A., Vic	Math.	1880	1,200 00
	Morden, Gilbert Walworth	B.A., Queen's	Sci.	1895	1,000 00
	Hendrick, Archer W.	B.A., Tor.		1897	900 00
	Ackerman, Effie M.	B.A., Tor.		1897	650 00
	Dolan, John H. (Interim)	B.A., Queen's	Class.	1899	700 00
Port Arthur	McCulloch, Andrew	M.A., Queen's		1895	1,200 00
	Morgan, James William		Eng., Hist.	1890	1,000 00
Port Dover	Liddy, William R	B.A., Tor.	Sci. (Interim)	1899	800 00
	Martin, John Strickler (Interim)	B.A., Tor.		1899	600 00
Port Elgin	Lillie, John Turner	B.A., Vic	Class.	1889	1,200 00
	Innes, Alexander R.			1892	750 00
	Mitchell, John Worth			1897	600 00
Port Hope	Kirkconnell, Thomas A.	B.A., Queen's	Math.	1888	1,200 00
	Mabee, George E.	B.A., Tor.	Fr., Ger.	1894	900 00
	Weir, Annie	B.A., Tor.	Eng., Hist., Fr., Ger.	1897	780 00
	Breuls, Ira D.		Sci. (Interim)	1896	850 00
	Moir, Katharine Elizabeth			1896	550 00
Port Perry	McBride, Dugald	B.A., Vic	Class., Math.	1871	1,300 00
	Stone, George			1883	850 00
	MacArthur, Christina M.			1895	600 00
	Underhill, James A.			1895	575 00
Port Rowan	Pugsley, Edmund	B.A., Vic	Sci.	1896	850 00
	Morgan, Lewis Jessie (Interim)		Fr., Ger.	1899	350 00
Prescott	Rose, Robert Charles	B.A., Tor.	Math.	1896	1,000 00
	McKim, William Andrew	B.A., Tor.	Eng., Hist., Fr., Ger. (Intr'm)	1897	700 00
	Chase, Reginald Melville (Interim)	B.A., Tor.	Class.	1899	550 00
Renfrew	McDowell, Charles	B.A., Queen's	Math.	1879	1,050 00
	Bryan, Hugh Wallace	M.A., Queen's	Class. (Interim)	1897	800 00
	Ewing, William Campbell	M.A., Queen's	Sci.	1896	700 00
	Menish, Jean Isabel (Interim)	B.A., Queen's	Eng., Hist., Fr., Gr.	1898	500 00
	Davidson, Jean (Interim)			1899	475 00
Richmond Hill	Farquharson, Robert Andrew	B.A., Queen's	Eng., Hist., Fr., Ger. (Intr'm)	1899	900 00
	Johnston, Frederick James	B.A., Tor.	Sci. (Intr'm)	1898	600 00
Simcoe	Christie, James Douglas	B.A., Tor.	Eng., His., Fr., Ger.	1889	1,300 00
	Power, John Francis	M.A., Queen's	Sci. (Interim)	1897	800 00
	Galbraith, Robert	B.A., Queen's	Math.	1899	750 00
	Thompson, John Fletcher	B.A., Tor.	Class.	1899	650 00
Smith's Falls	Houston, John Arthur	M.A. Trin.	Math.	1887	1,200 00

High Schools.	Principals and assistants.			Date of appointment.	Salary.
	Name.	Degree.	Specialists.		
Smith's Falls	Stubbs, Samuel James	B.A., Tor.	Eng., Hist., (Interim), Class	1897	750 00
	Johnston, John Kenneth	M.A., Queen's	Sci. (Interim)	1897	700 00
	Ryckman, E. Edith (Interim)	B.A., Tor.		1899	500 00
Smithville	Tremeer, James	B.A., Vic.	Class.	1898	900 00
	McArthur, Edith M. (Interim)			1898	375 00
	Bridgman, Clara M. (Interim)			1898	375 00
Stirling	Kennedy, George E.	B.A., Vic.	Sci. (Interim)	1893	900 00
	Rutherford, Walter Richard	B.A., Tor.	Class., Eng., Fr., Ger.	1899	750 00
Streetsville	Cameron, Aldis W.	B.A., Tor.	Eng., Hist.	1898	800 00
	Forbes, John William	B.A., Tor.	Math.	1896	650 00
Sydenham	Flach, Ulysses J.	M.A., Tor.	Math.	1895	1,000 00
	Harvey, William Blakely			1890	800 00
	Spooner, Armon Cortez (Interim)	B.A. Queen's	Eng., Hist., Fr., Ger.	1897	500 00
Thorold	Bald, William Francis	B.A., LL.B., Tor.	Class.	1897	1,000 00
	Smith, Margaret T. Hübner			1898	600 00
	Carefoot, George A.		Sci.	1898	700 00
Tilsonburg	Ross, Alexander H. D.	M.A., Queen's	Sci., Math.	1896	950 00
	Auld, Charles	B.A., Tor.	Math. (Interim)	1898	700 00
	McIntyre, Alexander Duff (Interim)	B.A., Tor.		1899	600 00
Toronto Junction	Colbeck, Franklin Charles	B.A., Vic.	Class., Eng., Hist.	1894	1,350 00
	Gourlay, Richard	B.A., Tor.	Class., Math.	1893	1,000 00
	Eastwood, Ida Gertrude	B.A., Tor.	Eng., Hist., Fr., Ger.	1892	1,000 00
	Chrysler, Minton A.	B.A., Tor.	Sci.	1895	900 00
	Page, Ralph Barlow (Interim)	B.A., Tor.	Eng., Hist., Fr., Ger.	1898	600 00
Trenton	Ingall, Elmer Ellsworth	B.A., Tor.		1895	1,025 00
	Longman, Edwin		Math.	1892	750 00
	Pattee, Ada		Eng., Hist.	1890	725 00
Uxbridge	Park, Henry George	B.A., Tor.	Class. (Interim)	1887	1,000 00
	Wagar, Gardiner Lincoln	B.A., Tor.	Math. (Interim)	1900	650 00
	Barr, Lydia			1891	500 00
	Struthers, Jean			1895	500 00

Vankleekhill	Jamieson, Thomas	B.A., Vic	Math	1889	900 00
	Might, Lincoln		Sci. (Interim)	1892	650 00
	Clothier, James O		Fr., Ger. (Interim)	1895	550 00
	McKinnon, Charles (Interim)			1899	500 00
Vienna	McGregor, J. O	M.A., Tor		1898	750 00
	Voaden, John B			1894	475 00
Walkerton	Morgan, Joseph	M.A., Tor	Class	1881	1,200 00
	Witton, James Gayford	B.A., Tor	Math	1896	1,000 00
	Field, John, Morden	B.A., Tor	Eng., Hist., Fr., Ger	1896	850 00
	Conn, Henry	B.A., Tor	Sci	1898	800 00
Wardsville	Weidenhammer, William B	B.A., Tor	Eng., Hist., Fr., Germ	1896	825 00
	Balls, George Herbert (Interim)	B.A., Tor		1899	500 00
Waterdown	Freeman, John Alexander	B.A., Tor	Class	1893	950 00
	Ferguson, Miles		Math	1896	600 00
	Aitchison, Belle			1897	400 00
Waterford	Mills, John Hudson	M.A., Queen's	Class	1899	1,000 00
	Clapp, Charles R			1893	700 00
	McPherson, Hattie Georgina (Interim)	B.A., Queen's	Fr., Ger	1900	400 00
Watford	Potter, Charles	B.A., Tor	Math	1892	1,000 00
	Race, Wilfred Ballentine			1893	750 00
	Reid Minerva E			1896	500 00
	Williams, Lorne Joseph (Interim)			1898	475 00
Welland	McCuaig, Herbert M	B.A., Queen's		1891	1,100 00
	McNiece, James	B.A., Tor	Sci	1896	800 00
	Laven, Ada F			1893	550 00
	Foster, Jessie		Fr., Ger. (Interim)	1899	500 00
Weston	Elliott, Thomas E	B.A., Tor	Eng., Hist., Fr., Ger	1890	1,000 00
	Leighton, Robert H			1895	600 00
Wiarton	Snell, Joseph A	M.A., Queen's	Math	1895	1,050 00
	Baines, Archibald W	B.A., Trin		1895	600 00
	Bowes, Ella (Interim)	B.A., Tor	Eng., Hist., Fr., Ger	1899	500 00
Williamstown	MacDonald, James	M.A., Queen's	Class	1898	1,000 00
	Witheril, Ebenezer Rufus	B.A., Queen's		1895	750 00
	Robertson, Alexander Morton	M.A., Queen's	Math., Fr., Ger. (Interim)	1897	700 00

Recapitulation.

Number of schools. Sex of teachers.	Number of teachers.	Salaries.	Universities, etc., of teachers.	Date of Appointment.
	Collegiate Institutes.	Collegiate Institutes.	Collegiate Institutes.	
Collegiate Institutes 37	Principals 37	Highest salary $2,500 00	Toronto 148	1.....1866
High Schools 93	Assistants 223	Average " H.M..... 1,560 00	Victoria 15	2..... 1870
130	Total 260	" " A.M..... 997 00	Queen's 29	2..... 1871
		Average salary $1,073 00	Trinity..... 7	3..... 1872
			McGill..... 1	1.....1873
			McMaster 1	2.....1874
			British..... 1	3.....1875
			American 1	3.....1876
			Interim 40	1.....1877
			Specialists 223	1..... 1878
			B. Paed 1	2.....1879
				3 1880
Teachers.	High Schools.	High Schools.	High Schools.	6.....1881
				8... . 1882
Gentlemen 470	Principals 93	Highest salary $1,400 00	Toronto 135	5... ..1883
Ladies 98	Assistants 215	Average " H.M..... 1,036 00	Victoria 25	5. ..1884
		" " A.M..... 663 00	Queen's 55	6.....1885
Total 568	Total 308		Trinity..... 7	11.....1886
		Average salary..... $778 00	McMaster 1	6.....1887
			Mtba 1	14 1888
			British 1	23..... 1889
			Interim 97	19.....1890
			Specialists.. 203	26.....1891
			D. Paed..... 1	35.....1892
			B. Paed 2	33.....1893
				41.....1894
	Grand Total.	Grand Total.	Grand Total.	51.....1895
				47.....1896
	Principals 130	Highest salary $2,500 00	Toronto 283	57... ..1897
	Assistants 438	Average " H.M..... 1,186 00	Victoria 40	68.....1898
		" " A.M..... 834 00	Queen's 84	71.....1899
	Grand Total.. 568		Trinity..... 14	12.....1900
		Average salary.... .. $914 00	McGill..... 1	568
			McMaster..... 2	
			Mtba 1	
			British 2	
			American 1	
			Interim 137	
			Specialists 426	
			D. Paed 1	
			B. Paed..... 3	

APPENDIX O.—*UNIVERSITY OF TORONTO; COUNCIL OF THE UNIVERSITY OF TORONTO; COUNCIL OF UNIVERSITY COLLEGE; SCHOOL OF PRACTICAL SCIENCE.*

1. Annual Report of the University of Toronto, 1898-99.

To His Honor, the Honorable Sir Oliver Mowat, K.C.M.G., Lieutenant-Governor of the Province of Ontario, Visitor of the University of Toronto,

May it please your Honor:

The Chancellor, Vice-Chancellor, and members of the Senate of the University of Toronto, have the honor to present their report upon the condition and progress of the University for the year 1898-99.

The following tabulated statement of the admission to degrees, and *ad eundem statum* and of the members who matriculated in the different Faculties from June, 1898, to June, 1899, is submitted:—

Law—	
Matriculation	2
Degree of LL.B	4
Degree of LL.D	7
Medicine—	
Matriculation	45
Ad eundem statum, from the College of Physicians and Surgeons	9
Ad eundem statum, from other Universities	2
Degree of M.B	51
Degree of M.D	2
Arts—	
Matriculation	217
Ad eundem statum, from other Universities	7
Degree of B.A	164
Degree of M.A	17
Agriculture—	
Degree of B.S.A	9
Pedagogy—	
Degree of D. Paed	3
Dentistry—	
Matriculation	5
Ad eundem statum, from the Royal College of Dental Surgeons	69
Degree of D.D.S	72
Music—	
Matriculation	5
Degree of Mus. Bac	3
Pharmacy—	
Matriculation	..
Ad eundem statum, from the Ontario College of Pharmacy	63
Degree of Phm. B	62
Applied Science—	
Degree of B.A.Sc	6

During the year thirteen hundred and thirty-four candidates were examined in the different Faculties and Departments, as follows :

Faculty of Law	6
Faculty of Medicine	190
Faculty of Arts	905
Department of Agriculture	11
Department of Pedagogy	6
Department of Dentistry	137
Department of Music	10
Department of Pharmacy	63
Department of Applied Science	6
Total	1,334

W. MULOCK,
Vice-Chancellor.

TORONTO, December 28th, 1899.

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2. ANNUAL REPORT OF THE COUNCIL OF THE UNIVERSITY OF TORONTO.

To His Honor, the Honorable Sir Oliver Mowat, K.C.M.G., Lieutenant-Governor of the Province of Ontario, Visitor of the University of Toronto :

MAY IT PLEASE YOUR HONOR :

The Council of the University of Toronto begs leave to present to your Honor the following report for the academic year ending with the 30th of June, 1899.

For some years past the Departments of Psychology and Physics have been in urgent need of increased accommodation for lecture rooms and laboratories. Previously to the present session it has been impossible to provide for these requirements. Owing to the closing of the University College residence, however, the Council has been enabled to make arrangements for the utilization of a portion of the residence wing for this purpose. Several vacant rooms have been fitted up at small expense, and thus temporary facilities have been furnished for some of the more pressing needs of these Departments, as well as for the work of advanced students, both graduate and undergraduate, who are prosecuting researches under the direction of the staff.

In consequence of the increased numbers of students in several Departments, there is a growing need for two large lecture-rooms, similar to those in the Chemical and Biological Buildings. This want is especially felt in the Departments of History and Psychology. Hitherto these Departments have been obliged to make use of the examination halls in the main building, which are extremely unsuitable for lecture purposes.

The Council begs to direct the attention of your Honor to the increased necessity which exists for the re-organization of the Department of Mineralogy and Geology and for its establishment on a basis commensurate with the importance of these subjects of study, and on a parallel with the provision which has been made for the teaching of the other sciences.

With the close of the academic session, Dr. Pike severed his connection with th University, after almost twenty years of service as Professor of Chemistry. Under his administration the Department of Chemistry has made remarkable progress ; especially in the practical work of the laboratory and in the introduction and encouragement of the work of research. Under his direction also the present Chemical Building was erected, and its admirable arrangements are almost wholly owing to his skill and foresight.

Hereto is appended the list of the Faculties in Arts and Medicine, together with the numbers of students in the various branches :—

Staff, 1898-1899.

Faculties of Arts and Law.

President, James Loudon, M.A., LL.D.

Physics—
Professor, James Loudon, M.A., LL.D.
Demonstrator, W. J. Loudon, B.A.
Lecturer, O. A. Chant, B.A.
Assistant-Demonstrator, J. C. McLennan, B.A.

Mathematics—
Professor, Alfred Baker, M.A.
Lecturer, A. T. DeLury, B.A.
Fellow, H. J. Dawson, B.A.

Chemistry—
Professor, W. H. Pike, M.A., Ph.D.
Lecturer, W. L. Miller, B.A., Ph.D.
Lecturer, F. J. Smale, B.A., Ph.D.
Assistant, F. B. Allan, B.A.
Lecture-Assistant, F. B. Kenrick, B.A., Ph.D.

Biology—
Professor, R. Ramsay Wright, M.A., B.Sc.
Lecturer, E. C. Jeffrey, B.A., Ph.D.
Assistant-Demonstrator, R. R. Bensley, B.A., M.B.
Fellow, J. Stafford, B.A., Ph.D.

Physiology—
Associate-Professor, A. B. Macallum, M.A., M.B., Ph.D.

Mineralogy and Geology—
Acting-Professor, A. P. Coleman, M.A., Ph.D.
Instructor, W. A. Parks, B.A.

Comparative Philology—
Professor, Maurice Hutton, M.A.

History and Ethnology—
Professor, G. M. Wrong, M.A.

Political Economy and Constitutional History—
Professor, James Mavor.
Fellow, S. M. Wickett, B.A., Ph.D.
Mackenzie Fellow in Political Science, A. W. Hunter, B.A.
Mackenzie Fellow in Political Science, J. R. Perry, M.A.

Philosophy—
Professor of History of Philosophy, J. G. Hume, M.A., Ph.D.
Lecturer and Demonstrator, A. Kirschmann, Ph.D.
Lecturer, F. Tracy, B.A., Ph.D.
Instructor, A. H. Abbott, B.A.

Italian and Spanish—
Associate-Professor, W. H. Fraser, B.A.
Instructor in Spanish, P. Toews, M.A., Ph.D.
Instructor in Italian, E. J. Sacco.

Roman Law, General Jurisprudence and History of English Law—
Professor, Hon. William Proudfoot.

Constitutional and International Law—
Professor, Hon. David Mills.

The following tables exhibit the numbers attending the pass and honor lectures in University subjects.

PASS.

Subjects.	Mathematics.	Physics.	Chemistry.	Biology.	Mineralogy and Geology.	Philosophy.	Logic.	Political Science.	History.
First year	132	37	...	85	.....	...	.....	.....	.....
Second year	.....	6	9	.....	35	138	128	.....	80
Third Year	.....	7	.....	.....	.....	.....	.....	40	37
Fourth year	30	.....	.....	.....	.....	32	.....	65	31
Totals	162	50	9	85	35	170	128	105	148

In no case do the numbers given above include honor students. Instruction in Physics, Biology and Chemistry was given to 63 students of the first year in Medicine, and in Physics to 73 students of the first year and to 40 students of the second year in the School of Practical Science.

HONOR.

Subjects.	Mathematics.	Physics.	Chemistry.	Biology.	Mineralogy and Geology.	Philosophy.	Political Science.	History.	Spanish.	Italian.	Phonetics.
First year	36	42	55	15	.....	.....	.....	.....	13	44	47
Second year	52	32	33	12	14	18	24	27	4	21	.....
Third year	13	18	17	12	13	20	24	48	4	14	.....
Fourth year	7	12	3	11	2	16	24	48	2	6	.....
Totals	108	104	108	50	29	54	72	123	23	85	47

The second year lectures in Chemistry and the fourth year lectures in Biology were attended by 49 students of the second year in Medicine. Instruction in Mathematics was given to 73 students of the first year and to 40 students of the second year in the School of Practical Science.

The following table exhibits the numbers taking the practical work in the laboratories of the University:

Laboratories.	Physical.	Chemical.	Mineralogical.	Biological.	Psychological.
Fourth year	12	3	2	11	16
Third year	18	17	13	12	15
Second year	13	33	14	12	.....
First year	17	15	.....	15	.....
Totals	60	68	29	50	31

Practical instruction in Chemistry and Biology was given to 63 students of the first year and to 49 students of the second year in Medicine, and in Physics to 85 students of the School of Practical Science. During the session eleven graduates in Arts were engaged in original research in the Psychological Laboratory and one in the Biological Laboratory.

The members of the teaching staff in Medicine for the past session were as follows:—

Faculty of Medicine.

Professores Emeriti.
James Thorburn, M.D.
M. H. Aikins, B.A., M.D.
W. W. Ogden, M.D.
J. H. Richardson, M.D.

Professor of Surgery and Clinical Surgery—
I. H. Cameron, M B., Tor.

Associate-Professor of Surgery and Clinical Surgery—
G A. Peters, M.B. Tor., F.R.C.S., Eng.

Associate Professors of Clinical Surgery—
A. Primrose, M.B., C.M., Edin.
B Spencer, M.D , Tor.
L M. Sweetnam, M.B., Tor.
H. A Bruce, M.B , Tor., F.R.C.S. Eng.
W. Oldwright, M.A , M.D., Tor.

Professor and Director of the Anatomical Department—
A. Primrose, M.B., C.M., Edin.

Associate Professor of Anatomy—
H. Wilberforce Aikins, B.A., M.B., Tor.

Lecturer and Senior Demonstrator of Anatomy—
F. N. G. Starr, M.B. Tor.

Assistant-Demonstrators of Anatomy—
A. R. Gordon, M.B., Tor.
R. D. Rudolf, M.D., C.M., Edin.
A. A. Small, M.B , Tor.
Clarence L Starr, M.B., Tor.
K. C. McIlwraith, M.B , Tor.
W. J. McCollum, M.B.. Tor.

Professor of Medicine and Clinical Medicine—
J. E. Graham, M.D., Tor., M.R.C.P., Lon.

Associate Professors of Medicine and Clinical Medicine—
A. McPhedran, M.B , Tor.
W. P. Caven, M.B., Tor.

Lecturers on Diseases in Children and Clinical Medicine—
H. T. Machell, M.D., Tor.
W. B. Thistle, M.B., Tor.

Lecturers in Clinical Medicine—
R. J. Dwyer, M.B., Tor.
G. Boyd, B.A , M.B., Tor.

Professor of Pathology and Bacteriology—
John Caven, B.A., M.D., Tor.

Lecturer on Bacteriology—
J. J. Mackenzie, B.A., Tor.

Demonstrator on Pathology—
John Amyot, M B, Tor.

Assistant-Demonstrator on Pathology—
John Stenhouse, M.A., B. Sc, Edin, M.B, Tor.

Laboratory Assistant in Bacteriology—
W. Goldie, M B., Tor.

Professor of Materia Medica and Therapeutics—
James M. MacCallum, B.A., M.D., Tor.

Associate-Professor of Pharmacology and Therapeutics—
C. F. Heebner, Phm. B, Tor.

Professor of Gynæcology—
U. Ogden, M.D., Tor.

Professor of Obstetrics—
A. H. Wright, B.A., M.D., Tor.

Associate-Professor of Gynæcology—
J. F. W. Ross, M.B, Tor.

Professor of Ophthalmology and Otology—
R. A. Reeve, B.A., M.D., Tor.

Associate-Professor of Opthalmology and Otology—
G. H. Burnham, M.D. Tor., F.R.S C., Edin.

Associate-Professor of Laryngology and Rhinology—
G R. McDonagh, M.D., Tor.

Professor of Hygiene—
W. Oldwright, M.A, M.D., Tor.

Associate-Professor of Toxicology—
W. H. Ellis, M A., M.D., Tor.

Associate-Professor of Medical Jurisprudence—
Bertram Spencer, M.D., Tor.

Lecturer on Medical Jurisprudence—
Hon. David Mills, L L.B., Q.C.

Extra-Mural Professor of Mental Diseases—
Daniel Clark, M.D., Tor.

Professor of Physics—
James Loudon, M.A., LL.D.

Lecturer on Physics—
C. A. Chant, B.A.

Professor of Chemistry—
W. H. Pike, M. A., Oxon., Ph. D. Göttingen..

Lecturers on Chemistry—

W. L. Miller, B.A., Ph. D., Munich.
F. J. Smale, B.A., Ph. D., Leipzig.

Lecture-Assistant in Chemistry—
F. B. Kenrick, B.A, Ph. D Leipzig.

Professor of Biology—
R. Ramsay Wright, M.A., B. Sc., Edin.

Assistant-Demonstrator in Biology—
R. R. Bensley, B.A., M.B., Tor.

Professor of Physiology—
A. B Macallum, B.A., M.B., Tor., Ph. D., Johns Hopkins.

The following table exhibits the number of the students registered as in attendance upon the lectures given by the staff of the Faculty of Medicine:—

Students of the fourth year	55
Students of the third year	56
Students of the second year	54
Students of the first year	73
Occasional students	70
Total	308

J. LOUDON,
President.

TORONTO, February, 1900

3. ANNUAL REPORT OF THE COUNCIL OF UNIVERSITY COLLEGE, 1898 99.

To His Honor, the Honorable Sir Oliver Mowat, K.C.M.G., Lieutenant-Governor of the Province of Ontario, Visitor of University College;

MAY IT PLEASE YOUR HONOR:

The President and Council of University College beg leave to present to your Honor the following report for the academic year 1898-99.

In pursuance of a resolution adopted to that effect on the 10th of June, 1899, the College Residence for male students, which had been carried on for many years under the direction of the Council, was discontinued at the close of the academic year. This step was taken by the Council because owing to various circumstances the numbers of those taking advantage of its facilities gradually decreased, and it was found impossible to maintain the institution without financial loss. Although the maintenance of a Residence in connection with the College is desirable on several grounds, it is the opinion of the Council that, owing to the smallness and unsuitability of the present building, the state of disrepair into which it has fallen through the lapse of time, and the improbability of making it attract any considerable number of students even if thoroughly reconstructed, any expenditure of money upon the present building to make it serve the purposes of a Residence, would be unwarranted. In addition to this there are certain requirements in the way of accommodation for teaching purposes which, in the opinion of the Council, may, at least in part and in a temporary manner, be provided for by the space rendered available by the closing of the Residence. Among the requirements are large lecture-rooms for the teaching of English, History and Psychology, as well as additional laboratory accommodation for the teaching of Physics and Pyschology. A portion of the building has been granted temporarily to the Council of the University of Toronto for the latter purpose. The question of providing new residence accommodation for male students has for some time been under the consideration of the Council, and in view of the inadvisability of repairing or extending the present building for this purpose, it is recommended that any further erection of a residence building or of residence buildings for male students should be made at some little distance from the main building. A site north of Hoskin avenue appears to the Council as the most desirable.

The matter of residence accommodation, facilities for gymnastic exercises and a recreation ground for the women students has been many times brought to the attention of the Council, and it is the opinion of that body that some provision of this nature is urgently required and cannot long be delayed. There were during the session 170 women students in attendance in University College, and hitherto it has been possible to make only the most inadequate provision for exercise and recreation, whilst on the other

nand the provision made for the male students in these respects is comparatively satisfactory, and has been made at a considerable outlay of funds. This disparity has been complained of by the women students, and cannot in the opinion of the Council be continued without affecting adversely the interests of the College. The Council has had under consideration the question of setting apart a portion of land for the erection of a residence and gymnasium for women students and the provision of convenient recreation grounds, and it has been decided, after consideration of the whole question of providing residences for men and women students, that the most desirable location for the purpose of a women's residence is the plot of ground situated on the north side of Czar street, which the Senate and Board of Trustees some years ago recommended should be reserved for this purpose.

The Council desires further to call attention to the necessity for further teaching assistance in the department of English. For some years assistance has been obtained, at a nominal expense in the heavy work of examining essays sent in by the students of the first and second years; but the aid so provided is quite inadequate. In the opinion of the Council, for the more satisfactory performance of this and other work of the department, a permanent addition to the staff is required.

The following information with regard to the staff and numbers of students in attendance in the various branches is appended :—

Staff 1898-1899.

President, James Loudon, M.A., LL.D.

Greek :—

Professor, Maurice Hutton, M.A.
Lecturer, A. Carruthers, M.A.

Latin :—

Professor, J. Fletcher, M.A., LL.D.
Lecturer, W. S. Milner, M.A.
Lecturer, G. W. Johnston, B.A., Ph.D.

English :

Professor, W. J. Alexander, B.A., Ph.D.
Lecturer, D. R. Keys, M.A.

French :—

Associate-Professor, John Squair, B.A.
Lecturer, John Home Cameron, M.A,
Instructor, St Elme de Champ.

German :

Associate-Professor, W. H. VanderSmissen, M.A.
Lecturer, G. H. Needler, B.A., Ph.D.
Instructor, P. Toews, M.A., Ph.D.

Oriental Languages :

Professor, J. F. McCurdy, Ph.D., LL.D.
Lecturer, R. C. Murison, M.A., B.D.

Ethics :

Professor, J. G. Hume, M.A., Ph.D.

The numbers of registered students taking full or partial courses in University College were as follows:—

	Fourth year.	Third year.	Second year.	First year.	Post. graduate.	Total.
Matriculated students	129	108	102	102		441
Occasional students	26	25	21	70		142
Extra-mural students		4	6	6		16
Graduated students	5	2	2	1	3	13
Totals	160	139	131	179	3	612

The following tables exhibit the number of students attending the pass and honor lectures in University College subjects:

PASS.

	Greek.	Latin.	English.	French.	German.	Orientals.	Ethics.	Ancient History.
Fourth year	7	25	54	28	11	4		
Third year	5	26	67	21	12	6	38	
Second year	20	70	65	38	35	9		
First year	24	113	105	64	47	28		105
Totals	56	234	291	151	105	47	38	105

HONOR.

	Greek.	Latin.	English.	French.	German.	Orientals.	Ethics.	Ancient History.
Fourth year	12	12	49	21	19	3	10	
Third year	8	11	27	23	21	4	29	
Second Year	10	9	36	21	17	4		50
First year	18	27	77	53	48			27
Totals	48	59	189	118	105	11	39	77

All of which is respectfully submitted.

J. LOUDON,
President.

TORONTO, January, 1900.

4. ANNUAL REPORT OF THE SCHOOL OF PRACTICAL SCIENCE.

To the Hon. R. Harcourt, M. P. P., Minister of Education:

SIR,—I have the honor to submit the annual report of the School of Practical Science for the year 1899.

The calendar year not being conterminous with the academic year, this report will cover the second term of the academic year 1898-9 and the first term of the academic year 1899-1900, except when otherwise stated.

The number of students in attendance at the School was as follows:

SCHOOL OF SCIENCE STUDENTS

Taking full courses.	2nd. Term Session 1898-9.	1st. Term Session 1899-00.
I. Year	70	91
II. Year	40	45
III. Year	31	37
IV. Year	6	10
Taking partial course	9	9
	156	192

UNIVERSITY STUDENTS.

	2nd Term. Session 1898-9.	1st Term. Session 1899-00.
Arts	14	21

The students of the School of Practical Science taking full courses are required to take University lectures in mathematics and physics. The attendance at these lectures was as follows:

	2nd Term. Session 1898-9.	1st Term. Session 1899-00.
Mathematics	108	139
Physics	108	131

The fees from the regular and occasional students of the School of Practical Science for the academic year 1898-9 were $8,612.85, being an increase of $2,047.35 on the fees of the previous year.

Of the above amount, $1,351 were paid to the Bursar of the University of Toronto, under the authority of an Order-in-Council dated June 16th, 1899, and the remainder, $7,261.85 to the Hon. the Provincial Treasurer.

The number of regular students who presented themselves for examination at the annual examinations of the academic year 1898-9 was one hundred and thirty-five. Of these 102 passed. Two candidates for special certificates passed the primary examination. The number of graduates was twenty-four. The total number of graduates to date is two hundred and thirty-six.

The following statement shows the geographical distribution of the graduates now living:

	Numbers.	Percentages.
Canada	168	74
United States	51	22
Other Countries	9	4
	228	100

The number of graduates who proceeded to the degree of B. A. Sc. at the University examinations of 1899 was six. The total number of graduates who have received the degree of B. A. Sc. is sixty-three.

The total number of graduates who have received the degree of C. E. in the University of Toronto is fourteen.

One graduate has proceeded to the degree of E. E. and one to the degree of M. E. (mining engineer) in the University of Toronto.

The regular courses in the School are:

(1) Civil Engineering (including Sanitary Engineering).
(2) Mining Engineering.
(3) Mechanical and Electrical Engineering.
(4) Architecture.
(5) Analytical and Applied Chemistry.

The following statement shows the courses of lectures and practical instruction, the instructors, and the numbers of students taking the various courses:

SUBJECTS TAUGHT BY THE FACULTY OF THE SCHOOL OF SCIENCE.

Subjects.	Instructors.	Number of Students.	
		2nd Term. Session 1898-9.	1st Term. Session 1899-00.
Organic and inorganic chemistry Applied chemistry Assaying	W. H. Ellis, M.A., M.B., Professor J. W. Bain, B.A. Sc., Demonstrator A. H. A. Robinson, B.A. Sc., Fellow	149	181
Mineralogy and geology Petrography Metallurgy Mining and ore dressing German	A. P. Coleman, M.A., Ph.D., Professor G. R. Mickle, B.A., Lecturer M. B. Weekes, B.A. Sc., Fellow	83	145
Statics Dynamics Strength of materials Theory of construction Machine design Compound stress Hydraulics Thermodynamics and theory of the steam engine French	J. Galbraith, M.A., Professor J. A. Duff, B.A., Lecturer R. W. Angus, B.A.Sc., Fellow	147	185
Drawing Architecture Plumbing, heating and ventilation Mortars and cements Brick and stone masonry	C. H. C. Wright, B.A.Sc., Lecturer A. H. Harkness, B.A.Sc., Fellow	146	177
Surveying Geodesy and astronomy Spherical trigonometry Least squares Descriptive geometry	L. B. Stewart, D.T.S., Lecturer A. T. Laing, B.A.Sc., Demonstrator	144	177
Electricity Magnetism Dynamo-electrical machinery Mechanics of machinery Rigid dynamics	T. R. Rosebrugh, M.A., Lecturer D. A. Williamson, B.A.Sc., Fellow	99	110

SUBJECTS TAUGHT BY THE FACULTY OF THE UNIVERSITY OF TORONTO

Subjects.	Instructors.	Number of Students.	
		2nd Term. Session 1898-9.	1st Term. Session 1899-00.
Algebra Euclid Plane trigonometry Analytical geometry Calculus Astronomy	Alfred Baker, M.A., Professor A. T. DeLury, B.A., Lecturer H. J. Dawson, B.A., Fellow.	108	139
Sound Light, heat, electricity and magnetism Hydrostatics	J. London, M.A., LL.D., Professor C. A. Chant, B.A., Lecturer W. J. London, B.A., Demonstrator J. C. McLennan, B.A., Demonstrator G. R. Anderson, M.A., Lecture Assistant	108	131

GENERAL REMARKS.

Drafting Rooms.

Owing to the increased attendance the present drafting rooms (four in number) are much over-crowded, and it has in addition been found necessary to use the upper corridor as an overflow drafting room. Seventeen students are now working in this corridor under a good deal of inconvenience. Should the first year class next session prove larger than the present one it will be impossible to find accommodation in the present building for work in drafting—The division of the classes rendered necessary by the lack of accommodation renders the work of instruction both difficult and unsatisfactory. The necessity for two additional drafting-rooms is very pressing.

The rooms fitted up in the attic for photographic purposes during the past summer serve their purposes admirably.

Chemistry.

The laboratory accommodation has become quite inadequate for the number of students now in attendance. It has been found absolutely necessary to divide the classes into several divisions. The first year in practical chemistry is divided into four and the classes in analytical chemistry and assaying are also subdivided. The appointment of a Demonstrator has greatly increased the efficiency of the department but the want of accommodation prevents this increased teaching power from being employed to the best advantage.

The absence of ventilation complained of in the last report is felt more strongly than ever.

A room set apart for gas analysis and for commercial researches is badly needed.

The department also requires several additional balances.

Mineralogy and Mining.

During the present year a pair of rolls for dry-crushing and pulverizing was installed. Owing to the increase in the number of students and the additions which have been made from time to time in the equipment, one attendant is no longer able to perform the necessary service in the laboratories. Another attendant is now required for the work in the stamp-mill, furnace room and assay room.

The lecture room is badly in want of some means of efficient ventilation. A ventilating fan discharging into the air shaft in the corner of the room would be sufficient.

Wall cases are required in the museum for specimens now on hand, and also a few cases for additions to the mineralogical and lithological collections. The floors of the museum and lecture rooms both in mining and metallurgy require attention.

The accommodation in the blowpipe laboratory is now insufficient, necessitating the division of classes much to the detriment of efficiency.

Electrical Laboratory.

During the year the electrical laboratory was extended by the addition of the room adjacent to the galvanometer room. In this room the advanced work in electrical measurements will be largely done, particularly standardization of measuring instruments, testing of insulation, and alternating current measurements. Among the more important instruments purchased during the year are a potentiometer, standards of inductance and resistance, an Ayrton & Perry secohmmeter for comparison of inductance, condenser and transformer for high potential and a set of receiving apparatus for Marconi telegraphy. Besides these, several enclosed arc lamps, a three phase electric meter and other minor appliances have been added. The storage cells are now being installed in a separate room and connections made to switchboards in the other rooms.

Space elsewhere, preferably on the fourth floor, is still needed for photometric purposes and the study of arc lamp mechanism. Among the more important apparatus which it is very desirable that the School should possess is a Rowland electro-dynamometer.

Surveying, Practical Astronomy, Etc.

Owing to the large increase in the number of students attending the School it has been necessary to add two transits and two levels, and also some chains, both link and band, to the present equipment. These instruments will require cases for their safe-keeping. In addition more compasses are needed in order to avoid the necessity of dividing the year or of having too many students in one party in the field. Some additional appliances are also necessary in order to complete the 100-ft. comparator, and also for gravity experiments.

It would be an improvement to have a small enclosure surmounted by an astronomical dome, built around the transit pier in the grounds.

Tests of Materials.

An abrasion machine was added during the year and the laboratory is now provided with facilities for investigating the properties of building stones and road materials. Apparatus has been provided for investigating this influence of time on the strength of timber. The chief requirements are: Additional extensometers, apparatus for calibrating testing machines, apparatus for the photo-microscopy of steel, and small machines for tension and torsion.

New Building.

In conclusion, it may be said that the only solution for the principal difficulties described above is the erection in the immediate future of a new building. The accommodation at present is unsatisfactory both to faculty and students, and must become more so as time goes on, with the ultimate effect of decreasing the attendance and lowering the reputation of the School.

It is proposed that a new building be erected on the lot or lots between the present School of Science grounds and College Street. This may involve the removal of Old Wycliffe College, now occupied by the Toronto Technical School. All the work now done in the older part of the School of Practical Science building, viz.: Analytical and Applied Chemistry, Mineralogy, Geology and Mining should be removed to the new building and the space thus vacated utilized for the expansion of the departments which remain. The new building should provide for the expansion in the subjects allotted to it.

It might be possible to take joint action with the University authorities and erect a building which would serve the requirements of the Arts course in Mineralogy and Geology as well as those of the School of Science in the subjects above mentioned. Should this be done it is essential that the rooms in the joint building to be occupied by the School of Science students should be entirely separate from those occupied by the Arts students.

It would be well if all the ground south and south-east of the School of Science and north of College Street were reserved for the purposes of Chemistry, Mineralogy, Geology and Mining.

J. GALBRAITH,
Principal.

Toronto, December, 1899.

SUPERANNUATION.

Summary for years 1882-1899.

Year.	Number of teachers on list.	Expenditure for the year.	Gross contributions to the fund.	Amount refund to teachers.
		$ c.	$ c.	$ c.
1882	422	51 000 00	13,501 08	3,660 10
1887	454	58 295 33	1,489 00	3,815 80
1882	456	63,750 60	1,313 50	786 86
1897	424	62,800 33	847 00	620 27
1898	420	64,351 88	1,472 00	284 58
1899	423	63,682 28	1,239 00	412 00

8 teachers withdrew their subscriptions from the fund during 1899.

*As the sum of $4 is deducted from each Superannuated Teacher's allowance, as subscription to the fund, the payments were $4 less in each case than given above.

ARCHÆOLOGICAL REPORT

1899.

BEING PART OF

APPENDIX TO THE REPORT

OF THE

MINISTER OF EDUCATION

ONTARIO.

PRINTED BY ORDER OF THE LEGISLATIVE ASSEMBLY.

TORONTO :
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ARCHÆOLOGICAL REPORT.

Honorable Richard Harcourt, M.A., Q.C.
Minister of Education:

Sir,—Herewith is presented the Archæological Report for the year.

Upwards of two thousand specimens have been added to the museum during the past twelve months. We are indebted to numerous friends for single, and small numbers of specimens from various parts of the province, and outside of it, but our largest additions represent the work of collectors in the counties of Victoria, (North) and Brant, those from the former locality having been brought together by Mr. George E. Laidlaw, of "The Fort," Balsam Lake, and presented by him as an accession to the fine collection he placed in our possession last year.

The only field work prosecuted by your curator was in connection with the examination of some mounds on Pelee Island, to which reference appears in what follows.

Had time and circumstances permitted, much more work of this kind might have been accomplished, and the hope may be indulged that opportunity for original research will more frequently present itself next year, for the reason already so often urged, namely, that the march of improvement is rapidly destroying traces, the existence of which, and particulars respecting which, should be recorded.

Fortunately, a considerable amount of investigation has been performed by Messrs. George E. Laidlaw, and W. J. Wintemberg, reports from whom appear relating respectively to the counties of Victoria and Oxford. Mr. A. F. Hunter presents a report in continuation of his work in examining village sites in North Simcoe, the object being to identify these, if possible, with the places mentioned by the early missionaries.

From the pen of Mrs. Wm. Stuart, San Geroñimo, Istmo de Tehuantepec, Mexico, an article on Aztec relics, will enable the Ontario reader to form some comparisons with the work of our own aborigines; and Mrs. Holden's translation of Mr. B. Sulte's paper on the Wars of the Iroquois is as instructive as it is interesting.

Mr. W. E. Connelley's papers on the Wyandots, and General Clark's philological and historical treatment of the derivation and signification of the word Toronto, are extremely valuable.

In accordance with many requests from students in Europe and America, Mr. A. T. Cringan presents a second contributiou on the music of the Pagan Iroquois.

I have the honor to be,

Yours respectfully,

Education Department, Toronto,
December 30th, 1899.

DAVID BOYLE.

ADDITIONS TO THE MUSEUM.

19386, birch-bark canoe, (French R) Mississauga Indian, J. H. Fleming, Toronto. 19387, part of small clay vessel from Uganda, Africa, Miss Buik, Toronto. 19388, small gouge and axe, or chisel, combined, lot 9, con. 4, Dummer twp., Peterboro' co., found by Patrick Young, Sen, Young's Pt., Clarence Bell, Toronto. 19389, large and beautifully made grooved axe from gravel bed near Brocton, N.Y., Thomas Connon, Brocton, N.Y. 19390, butterfly banner stone, Markham twp., York county, Joseph Chant, per Geo. E. Laidlaw. 19391, pottery sherd, Saguache co., Colorado, R. W. Carruthers, per Geo. E. Laidlaw. 19392-93, two steel knives from Huron site at La Fontaine, Tiny township, supposed to be Toanché, W. Richardson, per Geo E. Laidlaw. 19394-95, pipe and ornamental stem from same place. 19396, clay pipe, Fred Widdis, w. half lot 4, North West Bay, Bexley. 19397-98 worked fossil and chipped flint, Joseph Eads, lot 24, con. 2., Somerville twp., per Geo. E. Laidlaw. 19399, unfinished implement, lot 37, South Portage Rd., J. Waterson, Eldon twp., per G. E. Laidlaw. 19400, perforated disc, same place. 19401, pottery disc, same place, unperforated. 19402, stone axe, Fenelon Falls P.O., Dougald Brown, per Geo. E. Laidlaw. 19403-4, two celts, Mitchell's Lake, Eldon twp., Moses Mitchell. 19405-6, two chisels, Mitchell's Lake, Eldon twp., Moses Mitchell. 19407, nugget of native copper, A. Cameron, lot 20, con. 5, Lutterworth twp., per G. E. Laidlaw. 19408, slate gouge, G. Fox, Dalyrymple P.O., Mud Lake, Carden twp., per G. E. Laidlaw. 19409-10, two axes, G. Fox, Dalyrymple P.O., Mud lake, Carden twp., per G. E. Laidlaw. 19411, broken slate implement, G. Fox, Dalyrymple P.O., Mud Lake, Carden twp., per G. E. Laidlaw. 19412, fragment of elk horn, G. Fox, Dalyrymple P.O., Mud Lake, Carden twp., per G. E. Laidlaw. 19413-17, five oval, circular and ovate stones from ash beds, Eldon and Bexley twps., Geo. E. Laidlaw. 19418-27, ten hammer stones, degraded celts and others, Bexley twp., Geo. E. Laidlaw. 19428, fragmentary mealing stone from lot 5, con. 5, Bexley twp., Geo. E. Laidlaw. 19429-30, upper and part of lower mealing stone from ash heaps, Bexley twp., Geo. E. Laidlaw. 19431, chert nodule, from lot 22, con. 8, Eldon township, Geo. E. Laidlaw. 19432, porphyry from ledge near Mud Lake, Carden twp., Geo. E. Laidlaw. 19433, box of teeth from various village sites, Eldon and Bexley twps., Geo. E. Laidlaw. 19434, neolithic celt from Swaftham Fen, Cambridge, England, Sir John Evans, Hemel Hempstead, England. 19435, iron knife from lot 24, con 2, Somerville twp., Jos. Eads, per G. E. Laidlaw. 19436, string

of porcelain beads from Orillia, Geo. E Laidlaw. 19437, stone tool from Alaska, W. C. Perry, Winnipeg. 19438, red oxide from surface of Indian burial ground, Kamloops, B C., W. C. Perry, Winnipeg. 19439, rubbing-stone, Lytton, B. C., W. C. Perry. 19440, rubbing-stone, Lytton, B.C., W. C. Perry. 19441, fragment of skull, Lytton, B.C., W. C. Perry. 19442, improvised hammer-stone, Lytton, B.C., W. C. Perry. 19443, deer-horn chisel, Vancouver, B.C., Jas. Johnson. 19444, fragment soapstone disc, Washington, D.C. 10445, sperm whale's tooth, Samoa, Mrs. F. Smith, Toronto. 19446, model of framework of kayak (Eskimo.) 19447, handle and whiplash, (Eskimo). 19448 19449, fish killers, Rama reserve, (Mississauga), G. E. Laidlaw. 19450-19549, fragments of pottery with various patterns, Mississauga, G. E. Laidlaw. 19550-52, three finger-pullers, Mississauga, G. E. Laidlaw. 19553-4, clubs for pounding black ash to separate the layers for basket-making, G. E. Laidlaw. 19555, modern "war club," once owned by Admiral Vansittart, Rama reserve, Mississauga, G. E. Laidlaw. 19556, "trade" weapon, N. W. Indians, G. E. Laidlaw. 19557, moccasins, Northwest Territory, G. E. Laidlaw. 19558-19562, fragments of pottery from Lake Clear, lot 22, range 12, Sebastopol twp., Alex. Parks, Eganville. 19563-19662, flints from various localities. 19663-19671, clay vessels from mounds, Arkansas, R. W. Riggs. 19672, drinking cup of shell found near human remains, two feet deep on mound near Darien, McIntosh co., Georgia, Clarence B. Moore, Philadelphia, Pa. 19673, digging tool, Bluff Field, Ossabaw island, Bryan co., Georgia, Clarence B. Moore, Philadelphia, Pa. 19674, digging tool, Ossabaw island, Clarence B. Moore, Philadelphia, Pa. 19675, digging tool (*fulgur carica*) from surface near lighthouse mound, Fernandina, Florida, Clarence B. Moore, Philadelphia, Pa. 19676, drinking cup of shell, (*fulgur perversum*) found near human remains, two feet down; mound, near Darien, McIntosh co., Georgia, Clarence B. Moore, Philadelphia, Pa. 19677, worked shell from Florida; Clarence B. Moore, Philadelphia, Pa. 19678, fragment of pottery, Walker mound in Cooper's field, near Sutherland Bluff, McIntosh co., Georgia; Clarence B. Moore, Philadelphia, Pa. 19679-80, two fragments of pottery from mound D, Ossabaw island, middle settlement; Clarence B. Moore, Philadelphia, Pa. 19681, Northwest pipe (no data). 19682, Indian stone tomahawk from the Green swamp in Columbus county, North Carolina; Horatio Hale, Clinton. 19683, wampum beads said to be from South Orillia twp., Simcoe co.; Horatio Hale, Clinton. 19684, shell beads, Santa Cruz Island, California; P. Schumacher, Horatio Hale, Clinton. 19685, shell beads from an ancient mound near the Mississippi river: Dr. Willis De Hass, Washington; Horatio Hale, Clinton. 19686, Zulu beads, South Africa, Horatio Hale, Clinton. 19687, whale line (Eskimo); 19688 sword

blade, remounted; 19689-91, snow goggles (Eskimo); 19692, model iron spear; 19693, model ivory spear; 19694-97, pairs of boots; 19698, pair of shoes; 19700-1, baby's shoes; 19702, children's shoes; 19703 pairs of shoes (Eskimo); 19704-5, bracelets (Eskimo); 19706, bracelets (Eskimo).

From 19687 to 19706 the gift of F. F. Payne, Toronto.

19709, walrus's tusk, Magdalen island. 19710, model Eskimo harpoon with toggle head. 19711, pair of mitts (Eskimo). 19712, pair of mitts (Eskimo) 19713, gun flint, Baby farm, Lambton Mills; Miss Kirkwood. West Toronto Junction. 19714-18, gun flints, Baby farm, York twp.; J. Kirkwood. 19719, fragments of copper, Baby farm, Lambton Mills; Miss Kirkwood, West Toronto Junction. 19720, steel spear-head, Thames river bank, Kent county; W. Jull. 19721, busycon perversum, Fishing island, near Cape Hurd, lake Huron; Sir Sandford Fleming, C.M.G. 19722, knife, grave, Edmondton, Alberta; G. E. Laidlaw. 19723, stone axe, Taylor's mill-dam, river Don; R. T. Snyder, Toronto. 19724, gorget, North Cayuga, Haldimand county. 19725, six arrow points, found on lot 28, con. 2, south of Dundas st., Toronto; R. Sloan. 19726, bird amulet, lot 24, con. 3, south of Dundas St., Toronto; John H. Peel. 19727, stone adze, Dundas st., lot 23, con. 3; R. Sloan. 19728, bowl of pipe, Dundas st., lot 25, con. 11, Esquesing, in the river Credit; R. Sloan. 19729, waterworn pebble, found in gravel on Grand Trunk railway near Clarkson, resembles human workmanship. 19730, piece of worked slate, Bobcaygeon; Harold Cave. 19731, boat shaped amulet, North Cayuga; A. F. Stevenson. 19732, gorget, Norfolk county; J. G. Spain. 19733, clay pipe, lot 33, con. 3, Pickering. 19734, clay pipe head. 19735, worked bone. 19736, worked bone with waved pattern on border, 19737-9, gambling (?) bones. 19740-8, bone beads. 19749, core of chert. 19750, bone awl or needle, bored lengthwise. 19751, stone, grooved at one end. 19752, bone, partly cut. 19753-63, bone awls or needles. 19764-6, bone needles, eyed. 19767, bone awl (peculiar). 19768, bone awl or marker. 19769, horn tip, worked. 19770-8, arrow points.

(From 19733 to 19769 the gift of Jesse Cober, Cherrywood, Ont.) 19779, clay pipe, locality unknown. 19780, clay pipe, Nottawasaga township; David Boyle. 19781, clay pipe head, lot 12, con. 8, Nottawasaga township; David Boyle. 19782, pipe fragments, York township; B. Jackes. 19783, five arrowheads, Clark county, Kentucky, U.S.A.; Kentucky Geol. Survey, Frankfort. 19784, twelve delicately made arrow-tips—obsidian, jasper, agate and flint, Oregon, U.S.; Dr Rear, Toronto. 19785, four arrow-points, Nottawasaga township; Albert Lougheed. 19786, fifteen arrow-heads, Lawrenceburg, Ind.; J. Wood, Lawrenceburg. 19787, arrow-head, pure quartz, Guilford county, N. Carolina; Prof. Jos. Moore, Earlham College, Richmond,

Ind. 19788, four war arrows, West Virginia; Nat. Hist. Soc., Brookville, Ind., U.S. 19789, arrow-head, long neck, Lawrenceburg, Ind.; Dr. Craig, Lawrenceburg. 19790, fifteen arrow-heads. Lawrenceburg, Ind.; J. Wood, Lawrenceburg. 19791, chipped quartz, Grassy Point, Baptiste lake; David Boyle. 19792, arrow-heads, war (7), Mississippi; J. L. Kassebaum, Aurora, Ind. 19793, flints, unusual outline, Alabama: E. F. Hummell, Decatur, Ala. 19794-5, flints, Alabama; E F. Hummell, Decatur, Ala. 19796, flint, grooved on both sides, McGillivray township, Middlesex; Thos. Edward, W. Matheson, Lucan. 19797, arrow-heads (serrated), Lawrenceburg, Ind., J. Wood. 19798, flint (serrated) cross-section triangular, Alabama; E. F. Hummell, Decatur, Ala. 19799, spear or arrow-head (serrated), Dearborn, county, Ind.; Dr. Collins, Lawrenceburg, Ind. 19800, flints; Jos. W. Stewart, Strathroy. 19801, flints, lot 18, con. A, Huron township; Wm. Welsh, Amberley, P.O. 19802, flint, Franklin county, Indiana; Nat. Hist. Soc., Brookville, Ind. 19803, flint (necked and notched), West Middlesex, W. Matheson. 19804, flint, Uxbridge; John Thompson. 19805, flint, McGillivray township; John Taylor, W. Matheson. 19806, arrow-heads, Franklin county, Kentucky; Nat. Hist. Soc., Brookville, Ind. 19807, flints (5), Madison county, Kentucky; Dr. Collins, Lawrenceburg. 19808, flints, Fayette county, Kentucky; Dr. Collins, Lawrenceburg. 19809, jasper, Kempsley farm, near Point Edward, Ontario; Dr. Rear, Toronto. 19810, flint Kempsley farm near Point Edward, Ontario; Dr. Rear, Toronto. 19811. arrowheads, Hamilton county, Ohio; Dr. Collins, Lawrenceburg, Ind. 19812, flint, lot 9, con. 7, McGillivray township; Thos. Mead, W. Matheson. 19813, flints, (4), Alabama; E. T. Hummell, Decatur, Ala. 19814, fine leaf-shaped flint, Southern Ohio; Dr. Freeman, Chicago. 19815, knife or scraper, Clarksville, Ohio; Dr. Freeman, Chicago. 19816, flint, Brookfield, Mo.; Mr. Seeley, Dr. Rear, Toronto. 19817, flints, (5), square necked, Blanshard township, Perth co.; John McQueen, W. Matheson. 19818, knife or spearhead, (jasper), Clarksville, Ohio; Dr. Freeman, Chicago. 19819, flints, (13) North Carolina, E. T. Hummell; Decatur, Ala. 19820, flints, (10), Ohio, Mr. Demming; Xenia, Ohio. 19821, flints, (30), Lawrenceburg, Ind.; J. Wood. 19822, arrowheads, Kentucky; J. Muller, St. Mary's Institute, Dayton, O. 19823, spearheads, Port Huron, Michigan; McMillan, Dr. Rear, Toronto. 19824, copper spear or knife near end of Indian trail on lot 15, con. 8, Belmont twp., Peterboro' co.; H. E. Strickland. 19825, chief's large silver medal: Mrs. Cameron, Goderich. 19826, large water-worn stone, chipped as if for a sinker, lot 35, Lake road east, Bosanquet, Lambton; Alfred Willson. 19827, pair of moccasins, made by the Nascopees, Ungava bay; George B. Boucher, Peterboro'. 19828,

headed tobacco pouch, sealskin ; George B. Boucher, Peterboro'. 19829, stone pipe and beaded wooden stem ; George B. Boucher, Peterboro'. 19830, weathered knife or spear, Smooth Water lake, near Tamagaming, L. Nipissing; per Aubrey White, Dep Com. of Crown Lands. 19831, large argillite gouge and chisel combined; Aubrey White, Dep. Com. of Crown Lands. 19832, smoking pipe of wrought iron (sheet) bowl and stem made separately, bowl an inch and three-eighths high and probably five-eighths wide before being crushed; stem four and three-eight inches long and quarter inch in diameter, lot 1, con. 6, near Mississippi R., Drummond twp.: Peter Stewart, per Dr. T. W. Beeman. This specimen is probably of somewhat recent French (or other European) make, as it was found not more than a foot below the surface where, had it lain very long, it would have rusted completely away. 19833 large and partly polished stone axe, edges of shaft one and one-quarter inches thick, left in the pecked state, lot 14, con. 5. Lanark twp., Lanark co.; Wm. J. Affleck and John Affleck, per Dr. T. W. Beeman. 19834, small rubbing-stone of fine grained sandstone, lot 1, con. 6, Drummond twp., Lanark co.; Peter Stewart, per Dr. T. W. Beeman. 19835, small and slightly grooved stone axe, Drummond twp., Lanark co.; J. McEwan, per Dr. T. W. Beeman. 19836, counters used in Iroquois pagan game at wakes (dā-hon-kwa-ya-ha), Ind. Res., Tuscarora. 19837, wooden mask, formerly owned by Abram Buck, the chief medicine man, on the Tuscarora Reserve, Ontario. 19838, wooden mask, Tuscarora Reserve, Ontario. 19839, moccasins, made and worn by medicine man, Abram Buck, Tuscarora Reserve. 19840, moccasins, worn by an aged Indian woman, Mrs. Davies, on the Tuscarora Reserve. 19841, woman's rattle (Cayuga) Indian Reserve, Brant co.; Wm. Sandy. 19842-3, bone needles, Walker farm, Brant township, Ont. 19844, bone needle, Sealey farm, Brantford tp, Ont. 19845, bone needle, Walker farm, Brantford tp., Ont. 19846-7, bone needle, Sealey farm, Brantford tp., Ont. 19848, brass awl, Walker farm, Brantford tp., Ont. 19849, bone awl, North Toronto, near Carlton, Ont. 19850, half awl, with a second hole, Sealey farm. 19851-56, bone awls, Walker and Sealey farm. 19857-59, bone awls, Walker farm. 19860-61, bone awls, Kitchen farm, St. George Road, 1½ miles from Brantford, Ont. 19862-73, bone awls, Mitchell or Sealey farm, Brantford, Ont. 19874-83, bone awls, Walker farm, Brantford, Ont. 19884-85, bone awls, North Toronto, near Carlton, Ont. 19886-88, bone awls, Walker farm. 19889-99, iron awls, Walker farm. 19891, brass awl, Walker farm. 19892, large bone tool of unusual form. 19893-95, three foot-bones rubbed flat on the lower side and a rude attempt to burn a × on one side, Walker farm. 19896, ninety-one beads made from the bones of birds. Walker and Sealey farms

19987-20021, thirty-five tally bones made from the bones of birds, Walker and Sealey farms, 20022-23 flat beads from grave on Walker farm. 20024-25, three small bone tools; North Toronto. 20026, pottery marker (?) Sealey farm. 20027-28, pottery marker, fine lines; Walker farm. 20029, horn rod, $6\frac{3}{4}$ inches long, Sealey farm. 20030, horn rod, $4\frac{3}{4}$ inches, Walker farm. 20031-33, three spears, Sealey farm. 20034-35, two spears, Walker farm. 20036-39, four arrow straighteners (horn). See fourth annual Archæological report, page 56, Sealey Farm. 20040-41, two arrow-straighteners, Walker farm. 20042 76, 35 cylindrical pieces of horn, varying from 1 to $3\frac{1}{2}$ inches long, use unknown; see page 47, Ont. Arch. Report, 1891. 20077, prong of horn, cut and bored for a handle. 20078, partly made bowl for a stone pipe, Walker farm. 20079-80, clay pipes, Walker farm. 20081, stone pipe, Walker farm. 20082, clay pipe, Walker farm. 20083-87, clay pipe bowls, Walker farm. 20088-92, clay pipe bowls, Troy, near Brantford. 20093, clay pipe, Sealey farm. 20094, stone pipe, the bowl shaped like a bird's head, Sealey farm. 20095-96, two clay pipes, Sealey farm. 20097, clay pipe, formed like human head, Sealey farm. 20098, dog's head ornament, forming part of a bowl of a stone pipe, Sealey farm. 20099-20101, three clay pipe bowls, Sealey farm. 20102, small clay bowl (as if made by a child), Sealey farm. 20103-105, clay pipe bowls, Hagersville. 20106, clay pipe bowl, highly ornamented, Brantford city. 20107, clay pipe bowls from grave, Baldwin farm, near Brantford city. 20108, stone pipe bowl, bored for a stem. 20109-112, four unio shells, worn down as if used for smoothing purposes, Walker farm; see 4th An. Rept., page 51. 20113-114, shells used for scraping; see 4th An. Rept., page 51. 20115, rattlesnake shell gorget, $4\frac{1}{2}$x2 in., having four holes pierced through near the edge; the holes show signs of considerable wear; from a large ash-heap on the Sealey farm: two feet below the surface. 20116, piece of shell for an ornament, Sealey farm. 20117, unio shell ornament, Walker farm. 20118, string of 257 wampum beads from a grave in Beverly twp. 20119, string of 53 wampum beads, Walker and Sealey farms. 20120, string of 36 beads from a grave near Cayuga. 20121-22, two pieces unio shell, use unknown, Walker farm. 20123, piece of turtle shell with two well-worn holes, and having markings on the surface. 20124, piece of turtle shell, with hole. 20125, shell disc, Eagle Place, near Brantford. 20126, three spiral shell beads, Sealey farm. 20197, catlinite bead, $3\frac{1}{4}$ inches long, Walker farm. 20128, catlinite bead, Sealey and Walker farm. 20129, catlinite bead, Walker farm. 20130, catlinite pendant, markings on both sides, Sealey farm. 20131, string of 63 French beads, from grave at Sullivan's Landing, New York State. 20132,

string of 239 French beads, from grave at Beverly. 20133, slate pendant, Walker farm. 20134, stone pendant, Shellard's farm, near Brantford. 20135-136 beads of bear's teeth, Walker farm, near Brantford. 20137, bead made of a section of fish bone, Sealey farm, near Brantford. 20138, piece of bone showing cut made by a flint saw in the process of needle-making, Walker farm, near Brantford. 20139, bone sawed through longtitudinally as in needle-making, Walker farm. 20140-41, two bones partly sawed transversly as in making beads, Walker farm. 20142-4, three pieces of bone from which beads have been cut, Walker farm. 20145, fishing spear from grave, Baldwin's farm, Brantford tp. 20146, unusually formed flint, two notches, from Newport, near Brantford city, 20147-50, four flints, three being arrowheads and one leaf-shaped, from Newport, near Brantford city. 20151-54, four flints, chisel shaped, regular outline, Brantford suburbs. 20155-56, arrowhead and leaf-shaped piece of similar material to the coloured flint of Kentucky, eastern limits of Brantford. 20157, arrowhead, western limits of Brantford. 20158, quartzite, leaf-shaped piece, Shellard's farm, Mt. Pleasant, near Brantford. 20159-185, twenty seven arrowheads and leaf shaped pieces, many of them coloured Kentucky flint, also fine workmanship, Brantford limits. 20186-190, flint knives, Brantford limits. 20191, one slate (woman's) knife, West Brantford 20192-94, three flints for inserting in war clubs, sand hill near Brantford. 20195-213, nineteen arrowheads (blunt), Brantford limits. 20214-217, two diorite spear and two stone arrowheads, (old), Palmer and Shepherd farms, Mt. Vernon, near Brantford. 20218-20344, a hundred and twenty-seven war-points from farms in the neighborhood of Brantford. 20345 small slate knife, bank of Grand river, Brantford. 20346, small flint; bank of Grand river, Brantford. 20347-628, two hundred and eighty-two arrowheads; district round Brantford. 20629-630, two spear-heads, very regular outline; from Dunnville. 20631-745, a hundred and fifteen spear-heads, from Brantford and Mount Pleasant districts. 20746-49, four celts, part of a number dug up in a small space in the lumber yard of Wisner, Son & Co., Brantford. 20750-858, a hundred and nine celts, from Brantford and Cainsville districts. 20859, flint drill, 3½ ft. long; Sand Hill, near Brantford. 20860, flint drills, Shepherd's farm, Mt. Vernon, near Brantford. 20861, flint drills, Shellard's farm, Mt. Pleasant, near Brantford. 20862-64, three flint drills, Mohawk church fields, near Brantford. 20865-71, seven flint drills, eastern limits of Darling street, Brantford. 20872, one flint drill, Sand Hill, near Brantford. 20873-81, nine flint drills, district round Brantford. 20882-3, two leaf-shaped flints, unfinished, Shellard's farm,

Mt. Pleasant. 20884-20886, three flint scrapers, unfinished, West Brantford. 20887-20897, eleven arrowheads, unfinished, localities near Brantford. 20898-21063, a hundred and sixty-six flint scrapers, single ends, localities near Brantford. 21064-21071, eight flint scrapers, double ended, localities near Brantford. 21072, iron scraper, Walker farm, Brant township. 21073-21099, twenty-seven flint saws, Sealey and Walker farm, Brantford township. 21100-21101, two Huronian slate chisels, Shellard's farm, Mt. Pleasant. 21102 21103, two stone gouges, localities near Brantford. 21104-21148, forty-five celts or chisels, localities near Brantford. 21149, slate tool, 5¼ inches long, the edges running the full length, Walker farm. 21150, diorite tool, Sealey farm. 21151, slate tool, small, Walker farm. 21152, slate gorget, Brantford city. 21153, slate gorget, Shellard farm, Mt. Pleasant. 21154, slate gorget, Tutelo Heights, Mt. Pleasant. 21155, half gorget, S. Thomas farm, Tranquility, near Brantford. 21156, slate gorget with four notches on each edge, Otterville. 21157-21158, two pieces Huronian slate, roughed out for gorgets, Williams farm, Tranquility. 21159, disc, Huronian slate, Eagle Place, near Brantford. 21160, half of banner-stone (catlinite), Shepherd's farm, Brantford. 21161, rubbing stone, Eagle Place, near Walker farm. 21162, rubbing stone, grooved for smoothing arrows, farm, Mt. Vernon. 21163-21170, eight rubbing stones, Sealey and Walker farms. 21171, stone sinker, Sand Hill, near Brantford. 21172-21180, nine hematite paint stones, Sealey and Walker farms. 21181, stone mill, with three deep and three shallow hollows, from the farm of Thos. Brooks, Mt. Pleasant. 21182, pestle for pounding corn, field near Newport. 21183-21184, two discoidal stones, having hollows in each flat side, supposed for games, West Brantford. 21185-21197, thirteen hammer stones, flint, from East, and diorite from West Brantford. 21198, upper part of large pot, Kitchen farm, near St. George road, Brantford. 21199, half of upper part of large pot, Walker farm. 21200, portion of a pot formerly having handles, Walker farm, Brantford township. 21201, fragment of rim indicating an unusual shape, Walker farm, Brantford township. 21202-3, fragments of pottery to which handles were attached, Walker farm, Brantford township. 21204-21205, portions of pots from Sand Hill, near Brantford. 21206-21207, two pieces of a pot at least 17 inches in diameter, Seeley farm. 21208, portion of a large pot, showing marks as if having been formed in a casing of woven grass, Sealey farm. 21209, portion of pot having similar markings, Eagle Place, Brantford township. 21210 21233, twenty-four pieces of large pots, rim patterns, Sealey farm, Brantford township. 21234, portion of pot rudely ornamented with wave lines. 21235, part of small pot having a spout. 21236, portion

of rim of pot having deep serrations. The three above specimens are noticeable as being nearly pure clay, having no micaceous rock incorporated with it, as in most of our Indian pottery; Carlton, near Toronto. 21237-21240, four pieces of pottery, showing the kind of work done by pottery markers, Eagle Place, Brantford. 21241, handle of pot, Walker farm. 21242, portion of small pot, Walker farm. 21243, spout-shaped piece of pottery, use unknown, Walker farm. 21244, clay toy (child's pot), Sealey farm. 21245, plaster cast of Indian's head, pipe ornament, the original in stone, found at Jerseyville, near Brantford. Fifty fragments, consisting of pipe stems and parts of bowls, Walker and Sealey farms. Fifteen fragments of extremely rude attempts at pottery making, Walker farm. 21246, piece of stone, one end showing the marks of a large flint drill, the body covered with lines of an ornamental character, Brantford North; nineteen bears' teeth; two boar's teeth; number of teeth of small animals, as beaver, squirrel, etc.; one beaver tooth and three jaws of small animals; one bear's jaw; thirty-five pieces of deer-horn, some partly worked, thirty pieces of bone beads, etc. (Specimens under 21246 are from the kitchen middens on the Sealey and Walker farms.

(With the assistance of W. Wilkinson, M. A., principal of the Brantford city public schools, I have been able to ascertain the exact situations of the several farms mentioned here from No. 19842 to No. 21246, as follows:—

Walker farm. lot 5, con. 5, Brantford township, Brant county; Thomas farm, lot 27, con. 1, Brantford township, Brant county; Shephard farm, lot 10, con. 5, Brantford township, Brant county; Kitchen farm, lot 33, con. 1, Brantford township, Brant county; Mitchell farm, lot 9, South Ancaster Road; Baldwin farm, Baldwin's survey, Eagle's Nest, Brant county; Shellard farm, Church and Phelps' tract, Brantford township, Brant county; Brooks farm, Stewart and Ruggles' tract, Brantford township, Brant county; Sealey farm, Fairchild's Creek (Whitney's), Brantford township, Brant county.

21247, fragments of clay pot rims—various patterns, from sand hill, and Walker and Sealey farms, Brantford township.

The collection (19842 to 21247) was made by Mr. J. S. Heath, from whom it was procured.

21249, flute made by Hy-joong'-kwas, (like 17101, fig, 21, in report for 1898). 21250-1, two paddles used in the ashes ceremony at the Iroquois pagan feasts, Tuscarora. 21252, 18 patterns of tapa cloth (from inner bark of the paper mulberry) formerly used extensively by natives of the South Pacific Islands; Mrs. Forsyth Grant, Toronto. 21253, stone pipe, corniferous limestone Pelee Island; John Henning,

Pelee Island. 21254, head of 3-barbed bone harpoons (Wood Cree), N. E. shore of Lesser Slave Lake, N.W.T.; W. G. Long, Toronto. 21255, birch-bark bait scent-box (Wood Cree), E. shore of Lesser Slave Lake, N.W.T.; W. G. Long, Toronto. 21256, stone pipe (marble) probably of non-Indian make; bone and stem-socket like a large and a small inverted cone applied to each other; Dugald Fergusson, Sarnia township, per F. F. Evans, Toronto. 21158, photograph of adobé houses, Northern Mexico; Mrs. Joseph Workman, Walsenburg, Colo. 21259, small and rudely executed oil painting of a woman (4 x 5 inches) in black on a white ground; apparently of religious import and very old: Joseph Workman, Walsenburg, Colo. 21260-78, bears' teeth, Kitchen midden; Walker and Sealey's farm, Brantford township. 21279-80, boar's tusks; Walker and Sealey's farm, Brantford township. 21281, several teeth of small animals, including the squirrel and woodchuck. 21282-5, jaw of beaver, and three jaws of smaller animals. 21286, bear's jaw. 21287-321, pieces of deer-horn, partly worked. 21321-51, pieces of bone used in making beads, partly worked.

(From 21260 to 21351 were found in a kitchen midden, or refuse heap, on the Walker and Sealey farm, Brantford township, by Mr. J. S. Heath.)

21352, piece of what may have been a glass candlestick, belonging to one of the early French missions; found at considerable depth, near the Narrows, lake Couchiching, on the site of an old church, about 1870; from Miss M. C. Elliott, Toronto.

21353-4, two water-worn stones having a strong resemblance to grinders, or mullers, lot 1, con. 4, Tay township; Samuel Brown. 21355, celt, lot 22, con. 8, Vespra township; Thomas Dawson. 21356, small bone pendant (?) ornamented with incised lines, E. ½ lot 20, con. 9, Vespra tp.; Peter Curtis. 21357, small celt, E. ½ lot 20, con. 9, Vespra; Peter Curtis. 21358, tooth of small bear (?) E. ½ lot 20, con. 9, Vespra; Peter Curtis. 21359, small bone tool, E. ½ lot 20, con. 9, Vespra: Peter Curtis. 21360, clay pipe bowl, E. ½ lot 10, con. 5, Tay; John Hutchinson. 21361, steel razor (old French), lot 76, con. 1, Tiny; J. Bell. 21362, part of a clay pipe, lot 76, con. 1, Tiny; J. Bell. 21363, unfinished stone pipe (vasiform), lot 11, con. 6, Tay township; C. E. Newton, Esq. 21364, clay pipe (trumpet-mouthed), lot 11, con. 6, Tay; W. Bennett. 21365, sheet brass coiled conically, perhaps for an arrow tip, lot 11, con. 6, Tay: C. E. Newton, Esq. 21366, bit of sheet brass, lot 11, con. 6, Tay; C. E. Newton, Esq. 21367, iron knife, lot 11, con. 6, Tay; C. E. Newton, Esq. 21368, beaver tusk, lot 11, con. 6, Tay; C. E. Newton, Esq. 21369, large glass bead (red, white and blue). E. ½ lot 2, con. 6, Tay, farm of Hector McLeod; from his son, Thomas McLeod. 21370-71, bone awls, lot 10, con. 14, Oro township; Thomas Morrison.

21372, part of small, cylindrical, flat-bottomed, clay vessel, with unusual style of marking—probably finger-nail; lot 10, con. 14, Oro; Thomas Morrison. 21373, two bone beads—one within the other, as found; lot 10, con. 14, Oro; Thomas Morrison. 21374, rapier 23½ in. long (probably French), bearing near the hilt end the legend "[VE]R BVM DOMINI ANNO" on one side, and on the other "[M]ANET ET AETERNVN 1619" (the final *n* should, of course, be *m*); lot 99, con 1, Tiny township; found about twenty years ago; now presented by Samuel D. Frazer, Esq. 21375-434, Huron crania from an ossuary on N. ½ of lot 25, con. 12, Innisfil township, Simcoe county. This grave was estimated to contain the remains of 125 persons, and the skulls were exhumed by Harry W. Mayor, assisted by Thomas Redfern.

(From 21353 to 21434, per A. F. Hunter, Barrie.)

21435, fine jasperoid knife or spear-head, 5⅝ in. long; Dr. F. B. McCormick, south-east corner of Pelee Island. 21436, small and almost perfectly made celt; Dr. F. B. McCormick, Pelee Island. 21437, small and rudely made celt, Dr. McCormick, Pelee Island. 21438, Hammer-stone (degraded celt) of syenite, with whitish amygdaloidal softer masses, from ¼ in. to 1½ in. diameter; Dr. McCormick, Pelee Island. 21439, rudely formed small celt, only partly polished; Dr. McCormick, Pelee Island. 21440, well made small celt; Mark McCormick, Pelee Island. 21441, small and roughly-made gorget (two holes), apparently from a flat pebble; J. C. McCormick, Pelee Island. 21442-3, two roughly made small celts; Wm. Monaghan, Pelee Island. 21444, small and well-made celt; Matthew Lupberger, Pelee Island. 21445, small, well-polished celt; Herbert Bates, Pelee Island. 21446, small and accurately made celt; Samuel Piper, Pelee Island, west side. 21447-8, two celts—one very small (2½ in. long), from south-west quarter of mound on lot 36; Pelee Island, south-east. 21449, two small flints from mound, lot 36, Pelee Island. 21450, unfinished gorget 3½ by 2 in. and fully half an inch thick; mound, lot 36, Pelee Island; 21450, bone awl 3¾ in. long; mound, lot 36, Pelee Island. 21452, large astragalus, bear's tooth, small rodent's tooth, and spine from fin of large fish; mound, lot 36, Pelee Island. 21453, four flints; mound, lot 39, Pelee Island. 21454, The only two pieces of pottery found in the Pelee Island mounds; mound, lot 39, two feet deep. 21455-8, 18 arm and leg bones from mound, lot 36, Pelee Island. 21459, three quarts of carbonized corn and beans; mound on lot 39, Pelee Island. 21460, four small copper beads from mound on lot 39, Pelee Island. 21461, catlinite pipe, inlaid with lead, from Mr. Alfred Willson, to whom it was given by Hon. William Robinson, who procured it on the north shore of Lake Superior forty years ago. 21462-3, photographs of one of the Pharaohs,

(Rameses II, now in the Gizeh Museum, Cairo; he was the son of Seti I, who ordered the slaughter of the infants *temp.* Moses.) mummified—one showing the wrappings, and one an enlarged view of the face; Miss Jennie B. Moore, Toronto. 21464, conch, used to call people to the long-house on the Grand River reserve, Tuscarora township, Ont. 21465, small drum used at pagan dances on the Grand River reserve. 21466, horn rattle, used in certain dances on the Grand River reserve. 21467, woman's small turtle rattle; Grand River reserve. 21468, corn husk mask used in dances, Grand River reserve. 21469, wooden dish and 6 peach stones, used by pagan Indians in a game, on the Grand River reserve, Tuscarora township. 21470, game or conjuring apparatus found in a cache in the woods, near Yellow Girl Bay, Lake of the Woods, by Prof. A. B. Willmott, who presents it. It consists of 36 pieces of box-alder (?) each nearly seven inches long and from $\frac{3}{8}$ to $\frac{5}{8}$ inches in diameter, (peeled stems or branches) strung together side by side, by means of a cord passing round them near each end. Each stick is marked with eight roughly oval, brown spots—four on one side, and four on the opposite side;

21472, argillite axe. 21473, small, roughly made celt. 21474, partly worked soapstone. 21475, well marked pieces of pottery. 21476, fragment of cylindrically formed stone. 21477-9, small stone discs. 21472 to 21479, from Isaac Bowins, lot 51, front range, Bexley township. 21480, clay pipe head, broken. 21481, ditto. 21482, roughly-made celt, sharpened corner wise. 21483-4, small roughly-made celts. 21485, bone bead.

(21480 to 21485, from D. Hilton, lot 12, con. 7, site 31, Laxton township.)

21486, small water-worn stone, Ghost Isl. Balsam L. 21487, vertebral bone of large fish, ditto. 21488-90, flint chips, ditto. 21491, unfinished Huronian slate knife, block 9, Bexley township. 21492, water-worn stone, ditto. 21493, rough flint. 21494, partly worked Huronian slate. 21495-7, numerous flints and flint chips.

(21486 to 21497, from J. W. Laidlaw, "The Fort," Balsam Lake.)

21498, well made celt. 21409, oval hammerstone. 21500, part of bone awl. 21501, small bone bead. 21502, twenty-one fragments of pottery.

(21498 to 21502 from D. Brown, lot 23, con. 1, Fenelon township.)

21503, fine hornstone celt, and 21504, small celt or chisel, lot 9, con. 8, Sturgeon, Fenelon. 21505, part of broad, thin celt, lot 9, con. 8, Fenelon. 21506, soapstone pipe with deeply cut triangular designs; it is three inches long, roughly quadrangular in cross-section, and tapers from an inch and three-fourths in width at the top to an inch at the base. 21507, very fine, and almost perfect clay pipe. 21508, bird's head from clay

pipe. 21509-28, fragmentary heads and stems of clay pipes. 21529, barbed bone fishhook, lot 12, con. 1, Fenelon. 21530, very fine clay pipe, stem broken. 21531, small human head carved in stone—probably made by a white man. 21532, small piece of sheet brass. 21533, small arrow-head. 21534-5, bone beads. 21536, small bone awl. 21537, small soapstone disc bead.

(21506 to 21537, from E. W. Glaspell, who found them on lot 18, con. 13, Tiny township, Simcoe, unless otherwise noted above.)

21538-41, small bone awls. 21542, clay pipe-bowl, and stem of another. 21543-47, bone beads. 21548-51, phalangal bones flattened by grinding. 21552, bone bangle—notched for suspension. 21553, pointed tool of deer-horn. 21554, piece of large bone—much broken—ornamented with deeply cut quadrangular design. 21555, small piece of smoothly worked soapstone. 21556, very well made small arrow-head (chert). 21557, finely marked fragment of pottery. 21558-64, small, roughly made celts.

(21538 to 21564, from G. Rumney, lots 56 and 57 front range, Somerville township.)

21565, lower half of large flat celt, well sharpened. 21566, roughly-made celt, sharpened at both ends. 21567, small stone gouge, unpolished, 21568, water-worn stone 4 inches diameter, somewhat used as a mealing or upper grinding stone.

(21565 to 21568, from Alexander McKenzie, lot 22, con. 1, Fenelon.)

21569-72, rough celts. 21573, imperfect gouge. 21574, cup, coral (cystiphyllum sp. ?). 21575, iron tomahawk (no stamp).

(21569 to 21575, from A. McArthur, lot 26, con. 4, Fenelon.)

21576, piece of Huronian slate, 6 x 4 inches, and fully an inch thick in the middle—quadrangular in form and thinned along the edges, probably intended for a gorget; Charles Youill, Thorah. 21577, large iron tomahawk. 21578, leaf-shaped scraper, slightly curved. 21579, slate gorget or pendant, 4½ inches long, imperfect, 2 holes. 21580-83, small and imperfect celts. 21584, small mealing stone (gneiss) 8½ by 7 inches, 21585, twenty-two fragments of pottery.

(21577 to 21585, from Neil Sinclair, lot 25, con. 3, Fenelon township.)

21586, part of clay pipe bowl, bearing a grotesque human face. 21587, small stone pipe bowl of unusual form—roughly representing an animal's head, the mouth forming the stem-hole, 21588, three land shells (*melantho*) body whorl of each perforated for stringing.

(21586 to 21588, from Miss Alison Campbell, Kirkfield. Found S.P.R., Eldon township.)

21589, iron tomahawk of unusual shape, and having a semi-circular edge; John Martin, Uphill, Arden township.

21590, small and well-made slate pendant, $2\frac{5}{8}$ inches long, nearly an inch wide at one end and tapering to a rounded point at the other,—one hole near the wide end. Wm. Kennedy, Bobcaygeon; found on Ball Island at junction of Chemong, Pigeon and Buckhorn lakes, Peterboro' Co. 21591, bowl of large plain clay pipe, widening from an inch and a fourth at the junction with the stem to two inches at the tip—imperfect. 21592, small, rough plain clay pipe, almost whole. 21,593, part of clay pipe bowl, ornamented with lines and dots. 21,594-5, fragments of clay pipes. 21596, bone celt. 21597, ten fragments of marked pottery.

(21591 to 21597 from James Moore, lots 19 and 20, G.B.B. Bexley Township.)

21598, plain clay pipe bowl, F. Widdis, lot 12, N. W. B., Bexley township. 21599, pipe-bowl, ornamented with two collars, each having three rings. 21600, slick or smoothing stone(?) Joseph Shields, Victoria road. 21601, large and well made clay pipe bowl, Joseph Chant, Sunderland. 21602, soap-stone pipe, rudely carved to represent an animal's head, probably that of a moose, E. Lytle, S. P. R., Bexley. 21603, small polished celt. 21604-5, hammer-stones. 21606, human mask from bowl of clay pipe. 21607, very small, unfinished soapstone pipe, rudely carved, perhaps representing some animal at rest. 21608-9, slick or smoothing stones. 21610, bone spear or harpoon, four inches long, four semi-barbs on each edge of point. 21611, bone needle. 21612-18, pipe bowls and stems, imperfect. 21619, perforated stone disc. 21620, seventeen clay discs, unperforated, made from broken pottery. 21621, half of a perforated stone disc. 21622, ten stone discs, unperforated, from $\frac{3}{4}$-inch to 2 inches in diameter.

(21603, to 21722 from A. Ferguson, lot 12, con. 1, Fenelon.)

21623, slightly grooved stone hammer very well made; William Hoyle, Long Point, Fenelon township. 21624, six clay pipe stems. 21625, fossil (Murchisonia) from ashes bed. 21626, small hammer-stone. 21627, small thin celt. 21628, eight bone beads. 21629, part of very small clay vessel. 21630, horn spear point, with hole for handle attachment, hollowed also to receive a handle. 21631, flattened phalangal bones. 21632, perforated bear's tooth bangle. 21633, bone bangle. 21634, quartz scraper.

(21624, to 21634 from Neil Clark, lot 12, con 1, Fenelon township.)

21635, clay pipe slightly ornamented with three bands and a row of dots round the rim; G Winterbourn, lot 11, con. 8, Laxton township. 21636-38, fragments of pottery. 21639, soap-stone pipe unfinished, but probably intended to represent an owl; G. Staples, Norland. (See Mr. Laidlaw's notes). 21640, numerous

fragments of pottery; G. Lytle, lot 69, Frank R. Somerville. 21641, several well-marked fragments of pottery. 21642, piece of argillite six inches long, three and a-half wide and three-fourth inches thick, sharpened at one end, upper end of perfect tool missing. 21643, part of rubbing-stone. 21644-8, roughly made celts. 21649, large disc shell scraper. 21650-1, animals' teeth and fragments of bones.

(21641to 26651, from Wm. Halliday, lots 11 and 12, con 8, Laxton township).

21652, bone bead, colored with pink cross-bars. 21653, small arrow-head, finely made, no barbs, butt, wedge-shaped. 21654, bear-tooth knife. 21655-6, bone beads. 21657, bone awl seven inches long. 21-658, small tool from deer horn tip. 21659-61, bone awls. 21662-73, stone discs, unperforated. 21674-7, stone discs, perforated. 21679-81, clay pipe heads. 21682-4, very small stone discs, not exceeding a half inch in diameter. 21685-90, clay discs from old pottery, unperforated. 21691-2, small soapstone discs, perforated. 21693, small hammer-stone, roughly square in cross section. 21694, slic'k-stone. 21695-6, rough flints.

(21652 to 21696, lot 5, con. 5, Bexley township.)

21697, bone needle. 21698, clay pipe, imperfect. 21699, curiously formed bone hook. 21700-4, clay pipe stems. 21705, hammer-stone. 21706-19, clay discs, unperforated. 21720 bear's tooth.

(21997 to 21720, from Long Point, Fenelon township.)

21721, rough stone disc. 21722, partly worked stone, perhaps for a disc. 21723, large (one inch diameter) soapstone bead. 21724-6, clay pipe stems. 21727, tip of antler $2\frac{5}{8}$ inches long, bored at base lengthwise. 21728, very well formed and highly ornamented bone awl. (See Mr. Laidlaw's description). 21729, bone awl. 21730, very small bone awl. 21731, knife made from small bear's tooth. 21732, bear's tooth. 21733, five land shells perforated for beads. 21734, clay disc. 21735, small piece of graphite, for paint, perhaps. 21736, soapstone bead. 21737, long bone needle, Charles Grilse.

(21721 to 21737, from lots 44 and 45, Eldon.)

21738-9, contents of two graves, lot 23, con. 2, Fenelon township. 21740, long bone awl. 21741-4, short bone awls. 21745, fox's (?) tooth. 21746, small, curiously formed bone. 21747, hammer-stone. 11748, two fragments of pottery, one bearing a small human head moulded on the outside of the lip—very unusual in Ontario. 21749, stone disc $1\frac{1}{4}$ inches in diameter. 21750-6, clay discs from broken pottery. 21757, fragments of pottery from inside of embankment, lot 23, con. 2, Fenelon township. 21758, large number of pottery fragments marked with various designs from different places in North Victoria. 21759, seven fragments, comprising almost the whole of the

rim of a clay pot, six inches across the mouth, from Neil Sinclair, lot 25, con. 2, Fenelon township. 21760, mealing stone, Neil Clarke, lot 12, con. 1. Fenelon township.

(From 21472 to 21760 includes the collection made by Mr. George E. Laidlaw during the year, and now added to the museum.)

21761, large and somewhat rudely formed pestle, Lytton, Brit. Col., Wm. C. Perry, Winnipeg.

21762, amulet (?) of Huronian slate, finely made, 2½ inches in diameter, and 1½ inches thick, truly bored through its greatest width and hollowed on one side in line with the hole, James A. Mather, New Lowell, Sunnidale township, Simcoe county.

21763, femor of moose worked to two sharp edges along its length, probably for use in carrying skins. Red Pine Point, Grassy Lake, between Montreal river and Lady Evelyn lake, T. Southworth, Toronto.

21764, photograph of Mexican Indians. 21765, photograph of Mexican adobe housé. 21766, photograph of Indian miners on the Thompson river. 21767, photograph of Moqui Indians.

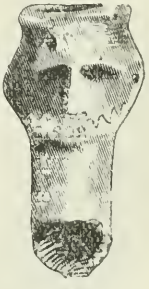
21764 to 21767 from Mrs. J. H. Thompson, Toronto.

NOTES ON SOME SPECIMENS.

Clay Pipes.

(20099).
Fig. 1—½ dia.

Although clay pipes of the general form, shown by figure (1) are not uncommon, this represents the only one having the bulbous portion of the bowl ornamented, otherwise than with upright, horizontal, or diagonal lines. The undulating lines on this specimen are, therefore, probably a mere continuous way of forming what would otherwise have been opposing sets of zigzags, in the making of which, without lifting the hand, the corners have become rounded. The work is quite as well done as might be expected from any white workman to-day, guided only by dexterity. This was one of three clay pipes found together, by Mr. J. S. Heath on the Sealey farm, Brantford township.



(20097)
Fig. 2—½ dia.

In figure (2) we have an illustration of what may be called a "trick pipe." Not much skill has been shown in modelling the features, but in some other respects the pipe is peculiar. The perforated ear-like projections are quite unusual, as are also the irregular lines on the jaw, extending from mouth to ears On the right side of the face the line is somewhat sharply zigzag, but on the left side it is more wavy. Perhaps the oddest feature of this

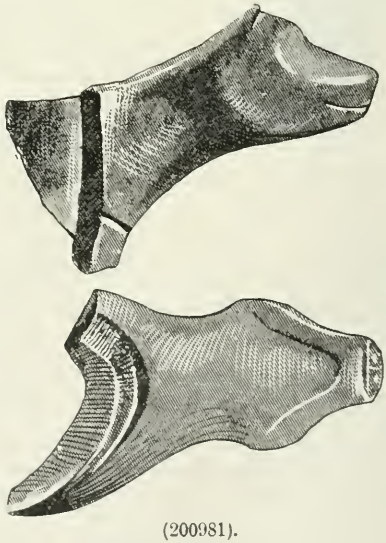
pipe is the hole representing the mouth of the face. It connects with the inside of the bowl so that when the smoker blew back into his lighted pipe the smoke would issue from this orifice. Found by Mr. J. S. Heath on the Sealey farm, Brantford township.

(20106)
Fig. 3—½ dia.

The style of ornamentation in the clay pipe here illustrated is quite different from that of any other pipe or any other bit of pottery we have. The three prominent bosses, two of which remain, and the two that rise scarcely above the body of the bowl, form a design greatly in advance of the usual simple arrangement of lines and dots. One of the high bosses has been destroyed so that nothing can be said of it, except that in all probability it resembled its opposite one above, and in line with the stem, but the latter differs from the third at the base of the bowl, one being relieved by means of three inside lines running around it, while the other has lines up and down. Each of the three is bordered by a series of short, radiating lines around the base, while the two plain bosses are encircled by dots. In each of the two remaining high ones a deep pit marks the centre. Between and above the bosses, and immediately below the rings around the upper end are four groups of horizontal dots, varying in number from five to seven. There is nothing at all about the pattern suggestive of European contact, and yet the whole of the work has been done with a delicacy of touch and a degree of exactness quite unusual. This pipe which formed part of Mr. Heath's collection, was found within the limits of the city of Brantford.

Stone Pipes.

Heads of quadrupeds, snakes and birds were often carved on stone pipes or moulded on clay ones, the accompanying figure, full size, is very likely intended to represent the head of a dog, and the workmanship is of a very superior order, the successfulness of attempts to bring out details, being quite marked. Cheeks, ears, eyes, nose, nostrils and mouth are all well shown, as is even the underside of the lower jaw, which shows suspiciously "white" details.



(200981).
Fig. 4—Full size.

Since the piece became detached from the pipe, it has been found by some native, who has made a good beginning in cutting off the lower

and pointed portion of the fragment to reduce it once more to symmetry, and perhaps for use as an ornament.

The material is a dark gray lime-stone, strongly resembling our Marmora lithographic stone. It takes a fairly good polish, and as we have a few other well-carved specimens of the same material, it would seem to be well-adapted for fine work. It was found by Mr. J. S. Heath on the Sealey farm, Brantford township, Brant county.

(20078)
Fig. 5—½ diameter.

In figure 5 we have an illustration of what was intended to be an unusually large stone pipe-head. The boring of the bowl has not been carried beyond a depth of three-sixteenths of an inch, and a bare beginning of the stem-hole appears a little more than an inch below the collar-notch on one of the edges, for the specimen in cross section is oval, the diameters being two and three-eighth inches by one and three-fourths, while the length is three and five-eighth inches. That it is very old is evidenced from the patina that has partly covered it. This is shown by the lighter portion of the engraving. Walker farm, Brantford township; Collector, J. S. Heath.

Fig 6 illustrates a type of pipe found more frequently east of Toronto than west of it, the latter district being hitherto represented in the museum by only three specimens—one from Wentworth, one from Welland, and one from Elgin. This one is from Pelee Island, where it was found by Mr. John Henning. It is made of the corniferous limestone that forms the island, and although the pipe is considerably weathered, it is still in good shape.

(21253).
Fig. 6—½ dia.

(21 639)
Fig. 7—½ dia.

From the Rideau Valley, North Hastings and Victoria county, we have twelve excellent specimens of this general outline, and three from Nottawasaga and Whitchurch to our north. The only other pipe I saw on Pelee Island was of the same shape as this one, both being round in cross section, while nearly half of all the others in our cases, are either oval, transversely, or slightly flattened on two opposite sides.

It is noteworthy that this pipe has no string-attachment hole, as have most pipes of this kind.

The pipe represented by figure 7 is of soapstone, and was found by Mr. G. Staples, of Norland, and comes to us through Mr. Geo. E. Laidlaw. It belongs to a class of which we have already had several from the same locality, and appears to have been intended to imitate an owl, but as it is unfinished, one can be safe only in stating that it was meant to represent some kind of bird. The work is not nearly so well done on this pipe as on the bear and eagle specimens from the same locality—this is evident, even in its incomplete state.

From the same district, Mr. Laidlaw has forwarded a number of other stone pipes, all possessed of unusual features. One of these, also of soapstone, resembles the head of some quadruped (probably that of a moose, as suggested by Mr. Laidlaw), but without ears. The stem-hole is bored in the middle of the face, the nose forming the base of the bowl. This pipe was found by Mr. E. Lytle, in Bexley township.

Those who have hitherto regarded Indian pipes of all shapes as examples of purely Indian art, and in many cases, as extremely ancient examples, will be surprised to learn from the most recent work on this subject, by Mr. Jos. D. McGuire, in the (just out) annual Report of the Smithsonian Institution for 1897, that all pipes except those of the straight, tubular form, are probably of comparatively modern origin, dating since the Discovery, and owing their forms directly or indirectly to European influence. Apart from this view, Mr. McGuire's essay is a most exhaustive and instructive presentation of the whole subject, and is amply illustrated from specimens in United States museums.

(20,026)
Fig. 8—½ dia.

BONE.

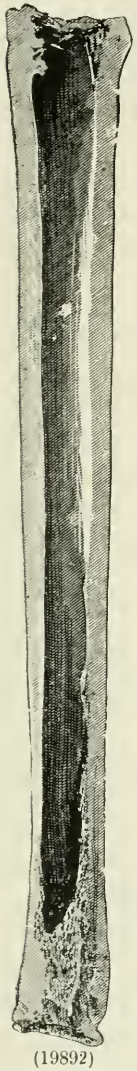
Bone implements as a rule seldom vary from a few well established models, but the form shown by figure 8 is not only an exception but a very beautiful one, from the Sealey farm, Brantford township, where the three ardent amateurs, Messrs. Heath, Waters and Crouse, found so many excellent specimens a few years ago.

The marking of pottery has been suggested as a possible use for this article, but there does not appear to be any reason why such an elaborate piece of workmanship should have been made for so simple a purpose. Besides, as nothing like this has ever been met with before, the probabilities do not lie in the suggested direction.

The hole has not been bored, but worked out by scooping.

In former reports reference has been made to the tedious operations of the Indians in separating one portion of bone, or of stone, from another. Figure 9 shows the result of such an operation on a bone ten and a half inches long, cut lengthwise. Throughout the greater part

of the distance the material has been sawn through to themarrow, but near the smaller end cutting has been only half done and the parts then riven asunder.



(19892)
Fig. 9—½ dia.

The average thickness thus cut is fully one-fourth of an inch and the length about nine inches. Flint and water were probably the agents used, and the marks made in the operation are easily seen. On the opposite and convex side the beginning of another cut has been made, no doubt with the intention of procuring from this piece two pointed tools such as we speak of as awls or needles, although the largest of this shape were probably employed for a different purpose.

Bone implements of such large size are seldom found, but one almost exactly the length of the bone in question was discovered by Mr. G. E. Laidlaw on lot 5, con. 5, township of Bexley, Victoria county. A half-sized figure of this very fine specimen will be found on page 22 in the Report for 1897-8.

The specimen illustrated here was found in Brantford township by Mr. J. S. Heath.

Phalangal Bones.

The very considerable number of phalangal bones that are found on old village and camp-sites, especially when such bones are rubbed down on one or on both sides until holes are the result, has always been a puzzle. The most commonly accepted theory is that the bones were in some way used as whistles, but nobody has ever been able to produce a sound from them.

Other bones of this kind are simply rubbed down on one side until a perfectly flat surface has been formed, while the opposite, unrubbed side is marked in different ways as if by burning. Burning is surmised because on some specimens the substance of the bone having been injured on account of the operation has scaled off, while in other cases the bone is discolored just as if the result of burning; besides, in some instances, where a little scaling off has taken place it can be seen that the discoloration extends beyond the surface.

In a series of eight here figured, in six cases the marks are simply bars, numbering from four to six, while one bears an S-like mark. On the fifth of the series there is no discoloration whatever, but six short cross depressions are quite distinguishable. The sixth is the

only one (among nearly fifty of such specimens) that has bars on the flattened side. On a few are the remains of marks that suggest an attempt to produce a cross; but the scaling of the bone where the lines may be supposed to have met, renders it difficult to speak with certainty on this point.

Fig. 10—½ diameter.

Whatever may have been the purpose of preparing such bones in the way first referred to, it would seem almost certain that in the latter condition they were employed in some game.

The specimens figured were collected with many others not quite so distinctly marked, in York township, York county (within a few miles of Toronto) and in Brantford township, county of Brant.

On the last of the bones figured will be seen what suggests the idea of a turtle. The jaws open sidewise, and similarly the notches that mark the tail are shown. This somewhat remarkable specimen I found on the Braeside farm, Richmond Hill, about thirty years ago. An old camp site marked the place, and from the beds of ashes several phalangal bones were taken, but all the others were distinguished by bars like those seen in the engraving.

I am indebted to Mr. Stewart Culin, Director of the Museum of Archæology and Palæontology in the University of Pennsylvania, for the following note as to the use of such bones for gaming purposes. As Mr. Culin has made a special study not only of Indian games, but of games universal, his opinions are most valuable. Having examined some bones I sent him, similar to those here figured, he wrote :—

"The phalangal bones of deer showing much use and scraped flat on one side might have been used as gaming implements, but this cannot be decided as yet with certainty. Such bones perforated and strung on a cord are used in a kind of cup and ball game among the Plains tribes. Some tribes of the Alaskan Eskimo employ the phalangal bones of the seal in a game, tossing the bones of one flipper up and winning or losing accordingly as they fall. They also have a similar game of tossing one bone, using the others as counters, as boys play for marbles. This is the nearest parallel I have yet found. The astragalus, I believe, was employed in games before white contact, but even here the evidence is not conclusive. . . . . .

"Next to the astragalus, the phalangal bone is universally the favorite bone used in games. In Russia the children set them up in a row and shoot at them with marbles, under the name of 'little women.'"

Readers interested in this subject will find several references to bone games in Mr. Culin's exhaustive work, "Chess and Playing Cards," in the report of the Smithsonian Institution, for 1896.

Rattlesnake Shell Gorget.

As a religious or ceremonial symbol, the serpent has always held an important place among primitive peoples, as well as among peoples too far advanced to be so so characterized. On this continent the most venerated, or most feared creature of the kind, was the rattlesnake (*Crotalus horridus*), in the north, and probably some other species in southern latitudes.

In Ontario we have not much to show us that the serpent was regarded in any very special sense, if we except the Otonabee mound, but just that it played a part in aboriginal mythology; a part apparently of less prominence than that of the turtle, or the bear, or the eagle. That the rattlesnake ranked above other serpents as a bugaboo is probably due to its ability to pro luce a sound at one end and to inject poison at the other.

In some of the southern states, more particularly in Tennessee, a considerable number of rattlesnake gorgets, made from the widest part of large conchs, have been found, but until quite recently nothing of the sort has appeared in Ontario. Indeed, any kind of engraved shell in this province is a rarity, for besides the one here referred to, the only specimen in the museum is that figured and described on page 57 of our report for 1896-97—from the Miller mound at the mouth of the Otonabee river. Rattlesnake gorgets are so called because there are engraved on the concave sides of the shell highly conventionalized representations of the animal in question, but as Professor W. H. Holmes says: "To one who examines this design for the first time it seems a most inexplicable puzzle, a meaningless grouping of curved and straight lines, dots and perforations. We notice, however," he continues, "a remarkable similarity in the designs, the idea being radically the same in all specimens, and the conclusion is soon reached that

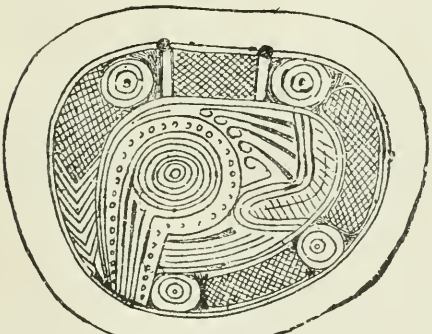


Fig. 11—$\frac{1}{3}$ dia., Tennessee.

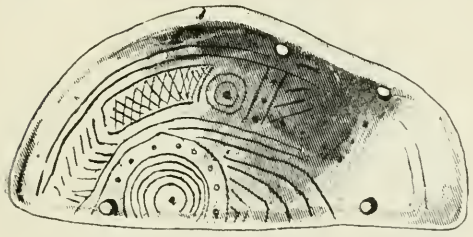
there is nothing haphazard in the arrangement of the parts, and that every line must have its place and purpose. The design is in all cases inclosed by two parallel border lines, leaving a plain belt from one-fourth to three-fourths of an inch in width around the edge of the disk. All simple lines are firmly traced, although somewhat scratchy, and are seldom more than one-twentieth of an inch in width or depth.

"In studying this design the attention is first attracted by an eye-like figure near the left border. This is formed of a series of concentric circles, the number of which varies from three in the most simple to twelve in the more elaborate forms. The diameter of the outer circle of this figure varies from one-half to one inch. In the centre there is generally a small conical depression or pit. The series of circles is partially inclosed by a looped band, one-eighth of an inch in width, which opens downwards on the left; the free ends extending outward to the border line, gradually nearing each other and forming a kind of neck to the circular figure. This band is in most cases occupied by a series of dots or conical depressions, varying in number from one to thirty. The neck is decorated in a variety of ways: by dots, by straight and curved lines, and by a cross-hatching that gives a semblance of scales. A curious group of lines occupying a crescent-shaped space at the right of the circular figure and enclosed by two border lines must receive particular attention, This is really the front part of the head—the jaws and muzzle of the creature represented. The mouth is always clearly defined, and is mostly in profile, the upper jaw being turned abruptly upwards, but, in some examples, an attempt has been made to represent a front view, in which case it presents a wide V-shaped figure. It is, in most cases, furnished with two rows of teeth, no attempt being made to represent a tongue. The spaces above and below the jaws are filled with lines and figures, which vary much in the different specimens: a group of plume-like figures extends backwards from the upper jaw to the crown, or, otherwise this space is occupied by an elongated perforation. The body is represented encircling the head in a single coil, which appears from beneath the neck on the right, passes around the front of the head, and terminates at the back in a pointed tail with well defined rattles. . . . . In some cases one or more incised bands cross the body in the upper part of the curve.*

From this description, as well as from figure 11 it will at once be seen that the specimen now in our hands (figure 12) is incomplete, but there cannot be a doubt as to its identity in design with the gorgets described by Prof. Holmes.

*From Art in Shell of the Ancient Americans, by Wm. H. Holmes, in the Annual Report of the Bureau of Ethnology 1880-81, pp. 290-1.

The straight edge in figure 12 still shows marks of the sawing that was required to separate this from the other portion, but it is, of course, impossible to say whether the cutting was performed after an accidental break had spoiled the whole gorget, or whether an entire object had been cut in two for any reason. In addition to the original suspension holes, other two have been bored near the straight edge, no doubt that the gorget might hang more evenly, in keeping with its change of shape, yet without any regard to the position of the figure which would now be upside down. It is observable too, that the more recently formed holes bear even deeper signs of wear than the original ones do. Still further comparing this specimen with perfect gorgets, it will be seen that only the tail and adjoining section remain while most of two other sections on a convex part of the shell are nearly worn out by contact with the human body—presumably. Of the second section from the tail, a little cross-hatching remains, and to the right are the three dots in line belonging to a bar that has disappeared; while further on still, is a single dot which was no doubt within two circular lines like those that remain, and near the dot are portions of the parallel lines separating the design from the border. The chevron, or diagonally opposed lines to indicate the tail are not so well made as those on most of the specimens figured in archæological books, but they show clearly enough the intention of the design.



(20, 155).
Fig. 12—½ diameter.

The fact that, so far as known, this is the only specimen of its kind found in Ontario is of itself almost sufficient to warrant the belief that it is accidental, intrusive, imported; and we may go so far as to say that the secondary wearing of the gorget upside down would tend to show that the owner of this portion either did not know, or did not care how it should be suspended, in which case it is plain that the symbolic nature of the work possessed no interest for him, and that he wore the gorget simply as a gewgaw, or because the lines may have suggested some "big medicine" on account of their being quite unlike anything he had ever seen before.

Why the body is usually divided into four sections separated by four circular figures has never been explained. We know that the number four had a peculiar significance to the ancient people, but this affords us no clue respecting the reason for its application in the present case any more than it does as to why circles, and sometimes bars, are used at all.

The gorget was found by Mr. J. S. Heath in a large bed of ashes, and fully two feet below the surface, on the Sealey farm, Brantford township.

Huron Crania.

Among sixty skulls received recently from Mr. Harry Mayor, who took them from an ossuary on the north half of lot 25, concession 12, Innisfil, Simcoe county, there are many that possess strongly marked features. In one, that of a child getting its second teeth, the metopic suture persists; in several cases the occipital protuberance is very large, and Wormian bones appear in about forty per cent, sometimes in very unusual places. In two skulls they exist on the fronto-parietal suture—in one case on the right side, about five-eighths of an inch below the fontanel, and in the other, half as low on the left. As to general form, the dolicocephalic probably prevails, but no measurements have yet been made.

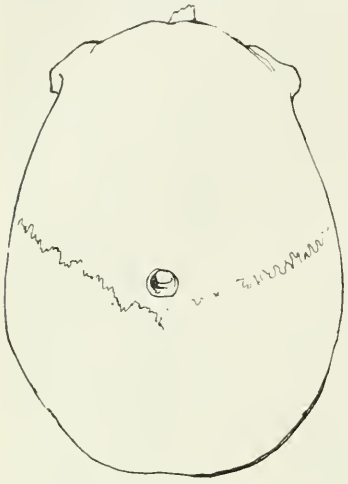


Fig. 13.

Two of the skulls are perforated as may be seen from figures 13 and 14, one with three holes almost immediately behind the frontal suture, and the other with one in front of it, and close to the fontanel. In the former case, the holes are about an inch and three-fourths apart, from centre to centre, and half an inch in diameter, while in the latter the hole is only about five-sixteenths of an inch in diameter, not reckoning the counter sunk edge.

Nothing can be clearer than that those openings were made after death, unless, indeed, they were made *immediately* before it, for there is no appearance of growth subsequent to the operation as would be seen had the heads been trephined successfully. In figure 13 the hole has been drilled, but in the other case the holes have been made by cutting—perhaps only enlarged by this means after drilling.

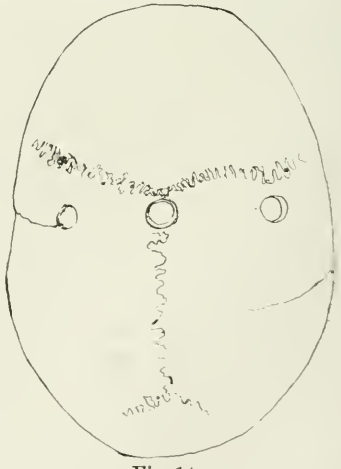
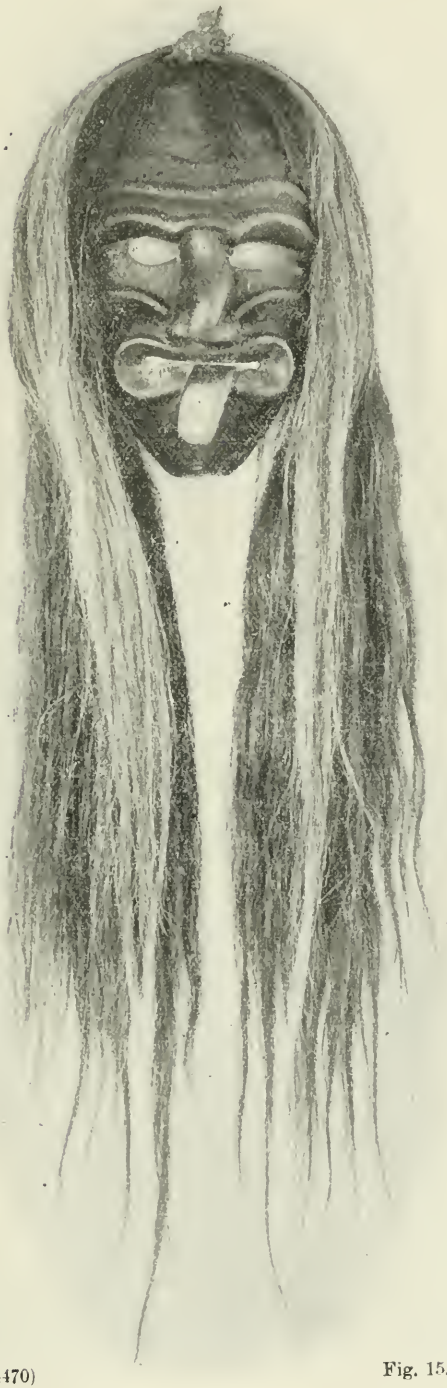


Fig. 14.

Dr. A. Primrose, professor of anatomy and director of the anatomical department in the University of Toronto, has, since the above was written, examined the perforations in the skulls, and confirms the opinion here offered.

IROQUOIS MEDICINE MAN'S MASK.



(24470)

Fig. 15.

The mask represented by figure 15 is a rare and valuable one. It is said to be the oldest, with one exception, that was on the Six Nation Reserve this year, when it came into our possession. It was made about seventy years ago, by John Styres (We-hwa-gĕh'-ti—Carrying News on his Back) who still figures as the leading "preacher" among the pagans on the reserve. He is a nephew of Hy-joong-kwas (He tears Everything)* who has for many years been Chief Medicine Man, wearing this mask on all ceremonial occasions, in connection with the False Face Society, as well as at feast mask-dances in the longhouse.

Although now too old to act in his official capacity, it was not without some hesitation that he concluded to give up the mask for "a consideration." With the assistance of Dah-kah-he-dond-yeh as interpreter, I received from Hy-joong-kwas the following account of how this mask originated:

* For portrait and reference to Hy-joong-kwas, see plate XV. in last year's report.

Mask Myth.

"After the big flood the original Mask or False Face was looking about him, and it was not long before he saw Niyoh, and Niyoh saw him. The two began to converse, when Niyoh, thinking that the Mask assumed too much authority, said to him: 'Did you make the land?' The Mask replied 'I did.' 'No you did not,' said Niyoh, 'I made the land, and if you think you have so much power, I would like to see what you can do.' The False Face enquired: 'What do you want me to do?' Niyoh looking around and seeing a mountain at a distance, told him to move it towards where they both stood. The Mask said: 'Very well—let us both turn round with our faces the other way.' He then ordered the mountain to 'come this way,' which it began to do at once, and would have come to where they were, had not Niyoh stopped it about half way. Niyoh then said: 'You have power, I see: but of what use is it to you? What good can you do with it?' To this the Mask replied: 'I use it to make people well when they are sick—now I would like to know what power you have.' Niyoh said: "Do you want to see my power?' and the Mask said he did. 'Very well, then,' answered Niyoh, 'I will show you my power, for I made the world.' The Mask then said: 'Make the mountain come close up to us.' On Niyoh's suggestion that the two should face about as before, they did so, and Niyoh told the mountain to come close up, and when it came to them he made it stop, and told the Mask to turn round quickly and see what had happened. This the Mask did, and brought his nose up with great force against the face of the mountain which stood there like a big wall, and the pain made him put out his tongue.

'Now,' said Nayoh, 'you see I also have great power, and, to make you remember this, your nose will remain crooked, and your tongue will always hang out.'

The False Face then knew that Niyoh had more power than he had, and ever since, the only sound he can utter is a tremulous and somewhat subdued "Hoh-o-o-o, hoh-o o, hoh-o-o-o-o.'"

On going to Hy-joong'-kwas' house for the mask, I soon learned this was no common matter of bargain and delivery. He and the mask had been in communion too long to be separated in any every-day business way. Having stirred up the fire in the stove, he left the interpreter and myself while he went into an adjoining room. In a little while we could hear the peculiar "Hoh-o-o-o, ho-o-o!" and shortly afterwards Hy-joong'-kwas returned wearing the mask and still muttering, or rather, perhaps, uttering, the whole of the extremely limited False Face vocabulary until he reached the stove. Here he hung the mask by its head-fastenings over the back of a chair and proceeded to make up a small parcel of home-grown tobacco in a scrap of blue

cotton print, and tied it with white thread over the brow of the mask, having first dropped a pinch of tobacco into some coals he had raked out in front of the stove.

After affectionately stroking the long hair which forms the wig, he replaced the mask on the back of the chair, whence he had removed it for the purpose of tying on the little parcel of tobacco. He then leaned forward, looking almost reverently at the mask, and speaking in a low tone to it, said: "My friend, [dropping a little tobacco among the coals] you are now going to leave me for the first time, and I am burning this tobacco to keep you calm and well-pleased. [More tobacco.] You and I have been together for a very long time. We have always been good friends. [Tobacco.] I have been good to you, and you have been good to me. You have cured a great many people, and we will not forget you. [Tobacco.] You may still do good where you are going, and I hope Ah-i-wah-ka-noh'-nis * will use you well. [Tobacco.] I have put a little tobacco on your head that you may always have some when you want it. [Tobacco.]

We shall not be very far apart, and we will often think of you, and will often burn some tobacco for you."

On concluding his touching little address he threw all that was left of his handful of tobacco into the fire, took the mask from the back of the chair, and, after once more stroking its hair, handed it to me with a request that I would rub its face with oil once or twice a year, as it had been used to such attention ever since he owned it, and would be pleased to be remembered in this way!

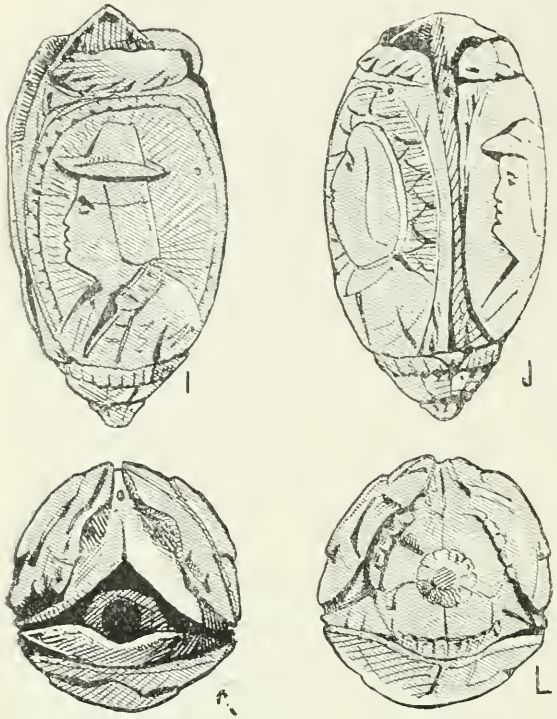
It was observed that he burned tobacco eight times during this ceremony, but whether the number of times was of purpose or otherwise I did not learn.

The Macassa.

It is quite unnecessary to say that the specimen here represented is not Indian, whatever else it may be. The only information I could get respecting it from the gentleman through whom it came into our possession, is that it was dug up many years ago on his father's land in the east end of what is now the city of Hamilton, a locality that has yielded an immense quantity of valuable archæological material of undoubtedly Indian origin. The specimen, which is two and three-fourth inches long, is of vegetal character, and suggests its having been a nut of some sort resembling the so-called ivory-nut. Its surface is sharply divided into three irregular oval panels, on each of which is carved a human head and shoulders. One of the heads is bare, one has a cap, and the third a hat. Each panel is

* The writer's Indian name in its Onondaga form. In Canienga, Ra'-ri-wah-ka-noh'-nis.

surmounted by a crouching animal, one of which strongly resembles a beaver. Each of two also has its distinctive border, but the third, and least symmetrical one, is plain. Under each panel stretches a long, roughly oval bar which is crenated crosswise, and below this the whole of the base seems to be a conventionalized flower on which much labor and some art have been expended.



(24471). Fig. 16.

Viewed from the opposite end one sees a grotesque face. The hole forming the mouth is connected with the interior which is hollow, but the eye-holes, although bored three-fourths of an inch deep have no such connection. Above and between the eyes, and in line with the ends of the panels, a small hole has been bored to meet with the cavity.

The only possible connection this curious specimen can have with any relics said to have been found in association with it, must be looked for through some of the early visits paid to Macassa Bay by missionaries, traders and travellers. The reference to the find is made here mainly in the hope that some reader may be able to throw light on the subject, through any knowledge he possesses of similar objects in Europe, or on account of his ability to recognize the style of art or workmanship.

PELEE ISLAND.

On the strength of information supplied to the Department by Mr. John E. Gow, of the Inland Revenue Office, Windsor, I spent several days under instructions from the Minister of Education, in making an examination of the southern portion of this island, where it was supposed there were some artificial mounds.

The most southerly point of Canada, and lying about midway between Ontario and Ohio, the situation is suggestive of communica-

tion between the two shores, which are here only about twenty miles apart, if measured from the head of Pigeon Bay, in Essex county, to Marble Head, at the entrance of Sandusky Bay, and considerably less, if

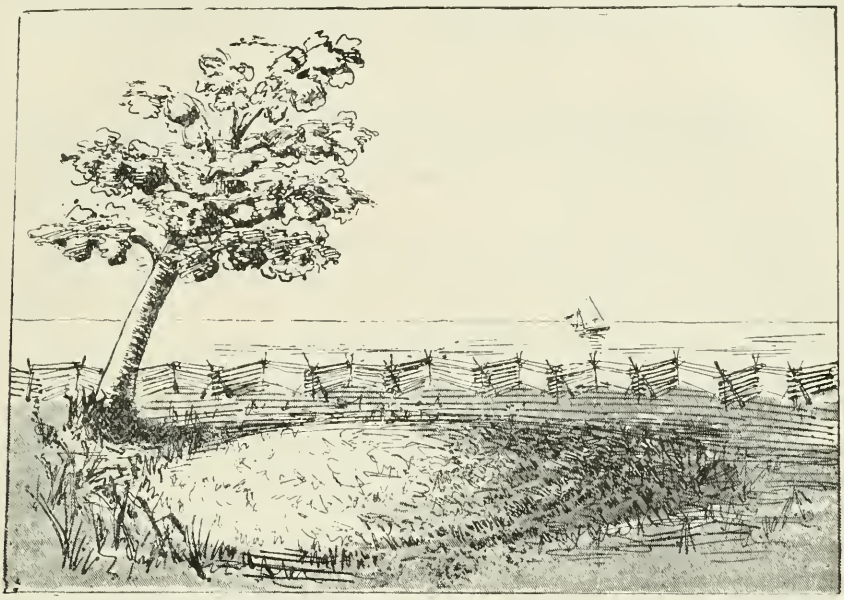


Fig. 17. A Pelee Island Mound.

reckoned from Pelee Point, on our shore. Here, if anywhere, one might expect to find traces of two or more peoples, and such proved to be the case.

As a place of resort and of refuge in early days, the island was admirably situated. Of its 11,000 acres, fully one-third was densely wooded, while the remainder was a marsh, affording a feeding and breeding-ground for immense numbers of water-fowl. A few smaller islands lie between Pelee and the United States shore, making intercourse by canoe very easy, while the nearest point on the mainland of Ontario is not more than eight miles off.*

*Geologically, the island possesses great interest. Previous to the erosion of the Erie basin, or previous to its subsidence (which is a more probable phenomenon) its connection with the north shore is evident from the similarity of its rock foundation. If glaciation is not accountable for the formation of the great lake basins, we know that since then its mighty forces have been exerted in polishing the rocks that form the shore line, wherever such rocks are exposed, and perhaps few finer examples of glacial striation can be found anywhere than on the south-east corner of Pelee Island, where deep grooves may be seen from fifty to seventy feet in length, some of them mathematically straight and others beautifully curved. The general direction of these markings is from west by south to south-west

On lot 54, near the south end, petroleum is pumped, and on the same farm, as well as some other places, there is natural gas.

The marshlands have been drained at a cost of $30,000, by means of eleven miles of main canal thirty feet wide and eight feet deep, with numerous ditches as feeders.

Whether the island is to be regarded as having been a part of the Neutral's territory, or of the territory of the Eries, we have no means of knowing, and just as likely as not it may have been a sort of Tom Tiddler's ground, for its advantages as a food-source, more especially in the matter of fish and fruit, must have made it an extremely desirable possession.

No part of the uplands exceeds forty or fifty feet above the lake level, while the greater part of it is less than half of that height, and the marshland, it is needless to say, is but little higher than the lake, where it is not actually lower.

The island being roughly quadrangular in form, the longer sides extending north and south, the situation of the mounds examined may be described as being at the south-east corner, known as Mill Point where the soil forms a thinner covering to the rock than elsewhere.

The first mound examined is on lot 39, within three hundred feet of the shore line. It measures forty feet from north to south and and forty-five feet from east to west, its central point being not more than three feet higher than the margin. For a distance of from fifty feet on the north and north-west to upwards of a hundred feet on the south and south-east the thin surface soil had been scraped from a bed of hard clay to form the mound, on and near the north end of which grows a chesnut oak six feet in circumference two feet above the ground. The stump of another oak, about the same size, still lies on the south-east quarter where it had grown. Aside from the appearance of the earth, the first evidence of workmanship we met with was a piece of coarse red jasper-like material having two conchoidal fractures. This object was at a depth of two feet from the surface, four and a-half feet from the centre of the mound on the west side. Slightly deeper, in the same place, were found two bits of chert, one a thin flake and the other a rough piece showing marks of chipping. About the same distance east of the middle, and at a depth of two feet three inches, we found a leaf-shaped flint and two fragments of pottery, but the most interesting find was a considerable quantity of charred maize and beans in what seemed to be a large pocket, just two feet west of the centre stake, and among these were four small copper beads of the same form as those found on Sugar Island, Rice Lake, three years ago. Near this place also were several small pieces of bone, and proof was not wanting that a body had been buried here. I was afterwards informed that many years ago some one had opened a mound in the neighborhood and taken away a number of copper beads. It is probable that this was the place referred to.

It need not be supposed that the corn and beans were placed here in connection with the burial, but that they were deposited, it may have

been long afterwards, by some one who chose the spot as a dry one in which to hide his little store. The beads, I think, came from a greater depth originally, but had been dropped near the surface and beside the corn by him who opened the mound in search of treasure (?).

On lot 34, the property of Dr. F. B. McCormick, to the west, is a somewhat extensive elevation forming a broad oval three feet high in the middle, and forty by fifty feet in diameter, the longer axis being north and south.

This elevation was thoroughly tested by means of numerous trenches in various directions, cut down to the hard-pan clay in every case, and sometimes even to a greater depth. Near the north end were found small quantities of charcoal and Indian corn, but with these exceptions there was nothing beyond the nature of the soil to show that human agency had been employed in constructing this mound. The conclusion arrived at was that the greater part of the elevation to the south was of natural formation, and that additions had been made at the north end, but for what purpose beyond that of symmetry it is hard to say.

The third mound opened was on lot 36, and as in the case of each of the others, was within a short distance of the shore line. Like these also, it was oval in outline, the diameters being thirty-seven and forty-three feet (the latter north and south) with an elevation of three feet four inches. Unlike the others, however, this earthwork consisted largely of stones corresponding to those found on the surface in this part of the island, *i.e.*, of corniferous limestone in large and small, flat, roughly angular masses, from a few pounds to forty or fifty in weight. These were not placed in any orderly way, but seemed to have been thrown on the heap carelessly to increase its size, except in the case of a skeleton that lay almost in the centre, but a little to the south-west, and which was covered from head to foot with a number of comparatively thin slabs, from two to three inches in thickness, and resting directly on the bones, except for the support they received from earth that had fallen in, or that perhaps had been so arranged when the burial took place.

As the work of removing the earth proceeded, human remains were found in other parts of the mound, but none of these was covered with stones.

The skull of the skeleton underlying the stones was crushed, but the larger limb bones, although exceedingly fragile, were unbroken, and these were preserved. The body had been buried lying on its left side, in an almost northerly and southerly direction, the head near

the centre of the mound, and the feet a little to the west. Across the feet of this skeleton was another lying east and west. The skull was missing, as were all the bones of the right side from shoulder to pelvis, but the large bones of the left arm and of both legs were perfect.

Near the head of the stone-covered skeleton and a little to the north-west, were the remains of a child. Portions of other skeletons were found within a few feet of these, to the north-east, as may be better understood by reference to the diagram, but in no case was any artifact found in association with the remains. A few flints and two celts and an unfinished gorget were found in the south-west quarter of the mound, upwards of ten feet from the nearest skeleton. A bone awl and a few other things lay nearly a foot deep.

With reference to the first and last mentioned mounds, it was clear that openings had been made some years ago, but by whom, or for what purpose, nobody knew. It is not improbable that the old hidden-treasure story had something to do with the disturbance.

The chief addition to our knowledge arising from this examination of the Pelee Island mounds is the fact that mound-building Indians once occupied the ground in question, but whether contemporaneously with the Neutrals on the mainland we cannot say. Indeed, it is not improbable that the Neutrals themselves were the builders.

I am indebted to Dr. F. B. McCormick for many courtesies and for information relative to the situation of the mounds. Dr. McCormick very amply supplemented the first intimation given us by Mr. John E. Gow, respecting the existence of these earthworks on the island, and he was also good enough to present the museum with several interesting stone relics, a list of which will be found elsewhere.

BIG CORN FEAST (Lower Cayuga).

During the Big Corn Feast in September last, I visited the Reserve with a desire to arrive at more certainty respecting some details connected with the gambling portion of the ceremonies, than I had been able to reach before. As the Seneca feast was over, and the Onondaga one arranged for the following week, it is evident that the time for the holding of this celebration is rather a matter of convenience than of regulation by the moon.

The first day's proceedings at the Cayuga longhouse were just coming to an end when I arrived there about one o'clock p.m. The forenoon's part of the celebration included the Big Feather Dance, and other dances connected with Ah-don'-wah, having the accompaniment "Heh-heh-heh," as was fully referred to in last year's report.

On the second day, beginning about half-past eight a.m., the proceedings were opened by a long speech from Wm. Smoke, after which Chief Abram Charles (De-ka-hy'-on) and Robert David (Jin-o-daw'-hon) addressed the people, of whom there were only thirty-five present, two-thirds of them being women and children, but before noon nearly a hundred persons had assembled, the sexes being about equally represented.

Naming a Child.

Part of Jin-o-daw'-hon's remarks had reference to the giving of a name to a Cayuga baby, such names being conferred only at this feast and that of mid-winter.*

At the proper moment a woman (not the child's mother) stepped forward and placed the baby in Jin-o daw'-hon's arms. He accepted the charge smilingly as he went on with his talk, part of the time walking round the stove, representing as it did the old-time fire. Before he had said more than a few words all the male portion of the audience joined in a somewhat noisy song, which it was quite satisfactory to observe had the effect of frightening the child, who, until that time, had conducted itself as stoically as a full-grown Indian, but now established a claim to average humanity by setting up a right hearty cry. Jin o-daw'-hon then handed the baby back to the woman who had placed it in his arms, this woman gave it to the mother and the ceremony was complete.

After this the speakers and a few others—five men, including the well-known Captain Bill, and two women—left the longhouse and took up their position in the cook-shanty at the east end, where two large pots containing corn soup were simmering over a slow fire. Here, William Smoke and Jin-o-daw'-hon "spoke pieces" for fully half-an-hour, and, in the course of their remarks, the speakers burnt small quantities of home-grown tobacco, by throwing eight pinches beneath the pots during the course of each speech.

On returning to the longhouse one man after another sang in his seat for a little while, then, rising, and continuing to sing, walked very slowly round the stove, "with the sun." The singer paused in both song and movement at each corner of the stove, where, with bowed

* See Ontario Archæological Report for 1898, pp. 168-9, for details respecting children's names.

head, and in an almost inaudible tone, he muttered some sentences, the significance of which was evidently understood by the others who gave suppressed responses at the close of each little soliloquy. Altogether nine men sung and spoke in this manner.

Two men from each end of the longhouse were appointed to collect stakes for the peach-stone game on the morrow, and thus the day's proceedings ended about half-past twelve, when the food was handed round.

The Peach Stone Game.

Next morning before nine o'clock the stake collectors had brought together in the longhouse a considerable quantity and variety of wearing apparel—dresses, sashes, belts, silk and cotton handkerchiefs, silk remnants and beads. A few of them were apparently new, and probably purchased for the occasion. Two men were engaged in pairing these articles, with reference to value as nearly as possible, in order that when the game was won by the clans representing either end of the house, each person who laid a stake on that side would receive with his or her own article another one as good.

As the Indian women are no more demonstrative than the men, it is not easy to say just how they regarded the rough-and-ready way the two men handled the goods, but nothing is surer than that had white men and women been concerned in such circumstances the consequences would have proved serious on both sides.

Few persons spoke while the assortment was going on, and those who did, expressed themselves in whispers because Rawen Niyoh was present overlooking all the arrangements, and it was not proper that he should be disturbed. When the sorters stepped about in the course of their work they did so gently, for the same reason.

After the completion of the pairing or coupling of the goods, Chief De-ka-hy'-on delivered a long speech, one of the rote or ceremonial kind, respecting the game and the duty of maintaining good feeling on the part of all, but especially on that of the losers, who might next time be favored by Niyoh. In the making of this harangue the chief emphasized very strongly the first syllable of the numerous short sentences of which it was composed, his voice dropping suddenly and keeping along an almost dead level until the last syllable was reached, and this he pronounced with a slight rising inflection. This is a common method of delivery which is only a little more monotonous than may be heard in other places where it is customary to make use of ceremonial addresses.

As I had occassion to mention last year when refering to the Seneca feasts, it does not seem necessary that on occasions of this kind

the chiefs or other leading men should be decked in all their "braverie." At this time De-ka-hy'-on appeared in plain clothes, not even wearing a coat, but simply a cotton smock-jacket.

A long pause followed his speech, but the silence was broken by a man who spoke briefly from the south-east corner, where were seated the Wolf, Snipe and Beaver clans, while at the west end were those of the Turtle, Deer, Bear, Eel and Ball, or, as some say the last named should be, Swallow.

A young man was appointed to lay down a sheet on the floor where the game was to be played, in the middle of the longhouse. The players and their assistants then arranged themselves as shown in the diagram on page 127, in last year's report, except that the former instead of facing each other east and west, did so north and south, while the assistants were seated at the west side.

Two men were called upon to play first and as one lost his chance, another player, (man or woman, as the game proceeded) took the place. Most of the women simply struck the bottom of the dish on the floor, and calmly awaited the result, but the men in nearly every case made passes with one or with both hands crosswise, circularly, and up and down, over the peach-stones, as if to influence them in some way while they rocked about, to settle right side up. A number of men representing the two ends of the longhouse crowded eagerly round the players to encourage them or otherwise, or to influence the luck so far as the stones themselves were concerned, by means of shouts and exclamations. At no time did the excitement become intense, for as the game came to a conclusion within an hour and a half, there was no time or opportunity for party-feeling to run very high. De-ka-hy'-on and Jin-o-daw'-hon again made long rote speeches, after which the stakes were handed to the winners, men and women, all of whom accepted their dues without the least manifestation of pleasure, or of pride on account of victory, or of any feeling suggestive of boastfulness such as white people show on occasions when they are winners. Similarly, those who were defeated conducted themselves with the utmost decorum, and without any sign of discomfiture or even of disappointment.

"Now," said Captain Bill to me, when the distribution came to an end, "the women is boss," meaning thereby that during the short time that would elapse until the close of the feast, all the arrangements would be in their hands, and as the most important part of what remained consisted of eating, the men did not occupy a very humiliating position.

At this time the women may decide, however, to appoint some other day upon which to hold the final dances, which are only four or five

in number, and not of religious significance. These are: 1st, the Trotting Dance (Găh-dah′-trohnt); 2nd. the Old Song Women's Dance (Gy-năh-gyh-ka-uh′-skă-nyĭ, the word having reference to the peculiar shuffling of the feet alternately in the dance); 3rd. the Joined-hand Dance, (Dā-you-dah-dā-noon′-tsons), and 4th, the Four Night Dance, (Gā-ne-wah-tsoon-tah′-gā). If the women wish they may add the Women's New Song Dance (Gy-nă-sā-ah-skă′-nyĭ).

Although this portion of the ceremonies is under the "patronage" so to speak, of the women, it is, as is customary on other occasions, managed by the chiefs and head men.

The Wake Game.

When friends and neighbors are assembled at a wake, it is customary for them to engage in a game to comfort in some measure the bereaved ones, and, to a certain extent, as a mere pastime. It may be premised that in so-doing there is no desire that either side engaged should win, and the whole of the proceedings are conducted with seriousness. If, during the progress of the game a young person should forget himself, the Head Man, or master of ceremonies takes occasion to point out that at such times light behavior is unseemly.

As many players, men and women, may engage as there is room to accommodate, when the two sides sit face to face.

The game consists in the hiding of a pebble (a marble, or a bullet is now often used) in one of four moccasins or mittens held in the lap of the hider for the time being, the other side trying to guess in which of these the object has been placed.

The Head Man makes a long speech to the players.

A singer having been appointed he sets the pace accompanied by his drum, by giving one of the three Wake Songs, the music of which the reader will find elsewhere in this report, and it is to be noted that these are the only wake songs, and are never used for any other purpose, or at any other time. Indeed, so careful are the people in this respect, that Dah kah-he-dond-yeh, who supplied this account of the game gives this as the reason why children are not allowed to attend wakes—hearing the songs they might be tempted to sing them thoughtlessly in the course of play.*

The singer for the time being may be seated anywhere on his own row, but the hiding must begin at one end, and the guessing at the far away end of the opposite row. To enable the guessers to point out the moccasin supposed to contain the object, a stick, or switch, about a

* Ka-nis-han-don supported the statement, but I am convinced that there is some other reason; one, perhaps, forgotten by the Indians themselves.

yard long is provided and passes from hand to hand. When the hider has done his part the moccasins are placed on the floor and guessing goes on. As soon as a particular moccasin is pointed out some who is nearest picks it up and gives it a rap on the floor. Should the sound indicate that the stone or marble is in the moccasin, one stick is taken from a pile of a hundred splints about the size of lucifer matches, and is placed to the credit of the successful guesser's side. If the guesser desires to make two points in the game he first lays, one above another, the three moccasins he takes to be empty. Should the remaining one be found to contain the object, his side gains two. On the other hand, a failure on his part, entails the loss of two. As soon as a correct guess is made the singer ceases his performance and one on the winning side takes it up, and thus the game goes on, each man or woman hiding and guessing in turn.

At midnight the head man stops the game until a meal has been served in the usual way, and consisting of the usual kinds of food. On ceasing to play, the two men whose duty it is to keep count, arrange everything to avoid confusion or dispute when the game is resumed. Each puts the little sticks used as counters and won by his side into one of the moccasins; the remaining sticks into a third, and the stone or the marble into the fourth.

Before play begins after the meal the head man repeats his introductory ritual. Should one side win all the counters before daylight, he puts them again into one heap as at the beginning, and play goes on, but as soon as daylight gives the first sign of appearance he makes a change in the manner of conducting the game by appointing two men to act for each row of players, and for the purpose of still further shortening it, he may leave only two moccasins in their hands. Hiding and finding now follow each other quickly, but the sticks no longer go to show which side wins, for they are thrown by the head man into the fire, and the hiding and guessing are kept up by the same sides (*i.e.* without interchange) until all the counters are burnt. The same official then breaks the pointing sticks which are also put into the fire, and he even treats the drumstick in the same way, having taken it from the hands of the singer. Last of all, he pulls the leather cover off the drum, puts it inside of the drum, and replaces the hoop. The instrument should remain in this condition until it is to be again used.

Before the people disperse to their homes in the morning, a gun is fired off outside of the door.

The Invitation Stick.

On the Sunday following the last Lower Cayugas' Big Corn Feast, a meeting was held in their longhouse to consider the terms of an

invitation extended to them by the Indians of the Onondaga Reservation, N.Y., to send a representative to a meeting about to be held. The only reason for referring to this matter here, is to mention that the messenger who carries the invitation is provided with what is called gan-onds-hă-dir-ūnd-dăgh′-kwā, which was interpreted as signifying—catching by the hand and pulling across—perhaps the meaning is better brought out by saying, a hearty or welcome grasp of the hand. However this may be, the thing itself consists of a small piece of pine about three and a half inches long, half an inch wide, and scarcely a quarter of an inch thick, to one end of which is attached a fine string forming a loop five or six inches long, on which are a dozen or so of small cylindrical shell beads, of the kind we now recognize as "white man's make."

The edges of the stick contain as many notches as the number of days to elapse from the day of delivery to the date of meeting. As each day passes a notch is to be removed from the stick.

The purpose of the beads, or wampum, as they are commonly called, is merely to show that the invitation is issued by authority, or as an evidence of good faith on the part of those who present the invitation.

Turtle Clan Names.

The following names were supplied to me by Ka-nis-han′-don and Dah-ka-he-dond-yeh. They are in Canienga form:

Men:—Skaniodyreo, beautiful lake; Gă-răh′-kwa, the sun; O-non-dahk′-ta, close by the hill; Găh-hū-tohn^{k}, sticks sticking up; Ra-ri-hwă wā′-ruts, to throw over a word, or the news; Dā-hok′-ha, twins; Jo-nōn′-dă-ti, over the hill; Yō-jees-kwt-ha, dry food; Da′-kā-he-dond-yeh, rows of trees; Dā-ka-nah-kwá-sah, twenty wives; Sōōh-kăh-doó′-nah, big leaf; Unt-yă-né-gă-ri, noon; Dā-wăh-nē-dó-găh, between the moons: Ga-roh′-hyak dat′-yi, along the clouds; Ra-ri-wah-ka-nóh′-nis, one who is sent.

Women:—Dā-wă-dā-roh^{n}-hu′-goh′-tah, moon through the sky; Ka-ri-hwă-hă-wi, she carries a message; Dā-duh^{k}′-toh, she came back; Yo-nāw-ta-wăh ′-ti, adjoining camps; Yăh-kō-răh-k ōnd′-yōh, she left her husband, or she lost a pail. Yŭh-ti-a-go-sah′-ny-ah, has no name; Gōh^{n}-hwă-ră′-to^{n}, she is counted; Găhn-hō-don′-kwas, she opens a door; Kă-nō-rōh^{n}-kwă, I like you; Wah-don-wah^{n}-jees′-o^{n}, tramped grass; Kă-ha-wan^{n}′-yū, she holds things; Kă-roh^{n}-hū′-rōōks, it becomes cloudy.

(NORTH) VICTORIA COUNTY.

By G. E. Laidlaw.

New Sites

Oral and substantial evidence on archæological affairs having accumulated during the present season, it was decided that it would be better to make a systematic series of visits to different localities to establish direct proof of aboriginal occupation, acquire material, and locate new sites; (in some cases several visits being paid to same localities) resulting in locating nine of these, and the acquirement of material from previously recorded sites and isolated places.

The first place to be looked into is the extensive site at Neil Clarke's, n. ½ lot 12, in 1st con., Fenelon township, and Mrs. S. Foster's, south half same lot. This is a very marked and prolific site, which, though known to local collectors for years and from which large quantities of relics have been removed, is now put on record for the first time. The area covered by very large and prominent ash beds is about 10 acres, and is situated on the top of a bank about 30 ft. high lying to the northeast of Goose Lake, which is nearly a mile distant. The bank here has a general direction of N.E. and S.W. with a slight curve to the east. On the edge of the bank are about half-a-dozen dump-heaps. The general shape of the habitations seems to have been circular and not of the "long house" form, and from their size, number and proximity to each other indicate a populous town long occupied. On a higher position of the bank, to the S.E., a number of pits (câches) and graves formerly existed. The surface of the ground was strewn with broken pottery, fire-fractured stones, implements, bones, teeth, etc. Soil very light and sandy. Surface slopes from bank to N.E., and formerly supported a heavy growth of pine, of which a few large stumps of about four feet in diameter remain. A spring formerly existed on the north side, and a never failing one runs at the bottom of the bank at the south side. This bank, as far as could be judged, encircled a lake, the basin of which being filled up with silt and vegetable growth, kept back, possibly, by beaver dams, now supports a marshy swamp of soft timber with a shallow, muddy pond in the centre.

Another site, which has just been brought to notice is on D. Brown's, lot 23, con. 1, Fenelon. It is partially cleared, but never ploughed; bush covers the remainder. The ash beds seem to be of large size; several were dug into with the usual results. A small water-course lies to the west. Graves have been opened here.

Forty years of cultivation have obliterated almost all trace of aboriginal occupation on Mr. Alex. McKenzie's farm, lot E, pt. 21.

con. 1, Fenelon, but relics are still ploughed up. Graves are said to be in the sand on the north side.

Across the road from the latter place, and about 1-3 of a mile away there is an artificial embankment. This work is on Mr. Alex. Jamieson's property, w. half of lot 23, con. 2, Fenelon, and comprises a semi-circular embankment, with a ditch on the outside. Dimensions, 220 feet in length, running north and south, facing west, being 330 feet at north end and 165 feet at south end distant from a creek winding N. E. into South Bay, Balsam Lake, on the east side of Birch point. Width of embankment, about 12 feet, and of the ditch the same; the depth from the top of embankment to the bottom of the ditch is 3½ feet in some places. No traces of palisades. Ash-beds situated between the embankment and creek, are shallow, of small size, and do not seem to have been occupied for a long period. There is a small group of single graves immediately to the north of embankment, whilst another group is on the top of a steep knoll fifty or sixty feet high, that stands about one hundred yards to the west and commands the work. One grave in each group being opened, displayed a few human bones as if the remainder had been removed for subsequent interment. There were no skulls or large bones excepting one shin bone, and the bones remaining did not exhibit any signs of decay, such as crumbling on exposure to air, that would lead one to conjecture that the missing bones had decayed. The graves were denoted by slight circular depressions, which were partly filled with surface stones.

A pine stub stood over the hill grave, measuring nine feet present circumference, four feet from the ground, but as the tree was fire-killed and burnt, and stumps standing on the ash beds and embankment measuring 3½ ft. present diameter, which were cut 40 years ago, it can be safely put down that 400 years have elapsed since occupation.

A second growth of pine is covering this place. The surface is extremely broken with high gravel and sand hills, two of them commanding the work at a distance of less than 150 yards, which is a peculiar feature if the latter was meant for defence. There may be more graves inside the embankment as it has never been disturbed. A large mealing stone, too heavy for removal, was noticed near by. The creek to rear of work has a bank of about 10 ft. A sheer fall of 6 ft. is about ¼ of a mile farther up stream, which would stop fish from going up any farther and thus materially aid the food supply during the fish-running season. Soil is fit for aboriginal cultivation. The village was beyond observation, especially from enemies coming by the lake, one mile distant.

On Birch Point, jutting north into South Bay, Balsam Lake, is what was probably a small fishing camp-site, as a row of ash-beds extends

along the west side; relics, pottery and mealing stones have been picked up. This point was cleared many years ago and has been under sod for a number of years. It is owned by Dugald Sinclair, number of lot being, broken front 26, con, 3, Fenelon. This locality has been much frequented by Indians down to recent date, as it is a favorite fishing-ground (bass and mascalonge), and in the fall the marshes on both sides of the point shelter vast numbers of wild-fowl.

It seems that the highly elevated, and extremely hilly territory much broken by deep valleys, extending from the site on Brown's to South Bay, 3 miles or so distant, was much frequented by the aborigines, and it will be necessary to investigate it more thoroughly. No doubt the shelter obtained was the chief factor, but its proximity to the lake and thus with the internal water highway extending to the Bay of Quinte, Lake Ontario, was another inducement for occupation.

Just one mile across the bay to the east side of the lake is another small site on lot west pt. 26 in con. 4, Fenelon, Archibald McArthur, owner. This was on a terrace touching the shore. Previous years yielded large quantities of pottery, pipes, celts, gouges and arrowheads, the lsat an unusual feature and taken in connection with being so close to water, might denote a later Algonkin occupation. With the exception of the flint arrowheads this site corresponds with the other sites that undoubtedly existed before the advent of the whites, a large, heavy, pine growth formerly covered the locality but the stumps having been removed no estimate can now be made.

These sites all exist south of previously described ones, in sandy or clayey loam localities, so we will now turn to several on the northern border of the rocky limestone country, just at the commencement of the granitic territory.

On lots 69-71 front range, Somerville, (Mr. Edward Lee, owner, $1\frac{1}{2}$ miles east of Big Mud Turtle Lake), is a site discovered this spring when clearing land. It is situated on a flat facing west, about 200 yds. wide and backed up by a hilly country to the east, a perennial spring is to the south and another to the north-east. Produced pottery, unio-shells, pipes, mealing stones, broken bones, teeth, etc. Site about 50 ft. higher than lake. No graves known as yet. The probability is that the village was not occupied for any great length of time, as the ash-beds were small and not very distinguishable. Soil suitable for aboriginal cultivation.

On lots 11 and 12, con. 8, Laxton, to the N.E. of Head Lake, on the properties owned by Mrs. Staples and G. Winterbourn, is the most distant site in that direction located up to date. This consists of a series of ash-beds, containing the usual remains and relics, situated on the north edge of a somewhat level piece of tillable ground, where it

drops to a lower level at the north. A never failing spring to the north is one of the features of the locality. One quarter of a mile to the east is the end of the limestone territory, marked by an abrupt ledge 20 or more feet in height running slightly to S. W. About one mile to the west the granite district begins, and extends to the north, the intermediate foundation being a sandstone of reddish yellow color. This plain is bounded on the east by the limestone ridge and on the west by a slight rise. Pine stumps up to 4 ft. in diameter stand on the ash-beds.

About ¾ of a mile southwest of the latter place is another site on David Hilton's farm, lot 12, con. 7, Laxton. This is 60 rods east of Hilton's Bay, which is south of Hilton's point, n. e. corner of Head Lake. General indications of aboriginal occupation, such as ash beds, pipes, celts and pottery on a piece of land two or three acres in extent. When first settled, in 1860, it was covered with a heavy growth of pine up to five feet in diameter (one stump was measured). East of this site is a ravine which holds water. This locality was also used by more recent Indians, as several iron tomahawks have been found scattered around, and maple trees showed evidences of tapping, several also having large slabs split off them. A pile of sap-troughs, 10 feet wide, 20 feet long, 2 feet high, of old rotten birch-bark was noticed on a hill. Present day Indians have resorted to this locality, as it is an ideal hunting and fishing ground, and they have been known to portage to Gull River, four miles east, which flows into the Trent system of waters. Head Lake waters and the several minor systems belonging to it flow west by the Head River, ultimately emptying into Georgian Bay *via* Severn River, thus giving canoes access to the Huron country, but necessitating many portages over rapids and falls.

No doubt a prehistoric trail extended from Head Lake through Hilton's site, thence to Winterbourn's, on to Beech Lake, which is 1 by 1½ miles in extent, and from there to Gull River, a total distance of about four miles. The country immediately to the north precludes the idea of trails, as it is one vast territory of high, steep granite ridges, swampy valleys, broken by innumerable lakes, rivers and beaver-meadows, forming the best of hunting and fishing grounds even to this day. To the south of the above route the limestone country is too rough and hilly for a practicable portage. Several trips were made to the granitic regions of the townships of Longford, Dalton, Digby and Ryde, in quest of information or evidence of aboriginal occupation, but none was forthcoming. No visible evidences were noticed, such as graves, trenches, ash heaps, mounds or embankments. See Report for 1897-98 p. 53. At the south-west corner of Ghost Island, Balsam Lake, traces of a flint-worker's "shop" may be seen where, at a break in the bank or "landing," ashes and bones, intermingled with flint chips, may be scraped out.

The following are the new sites that have been examined:—

No. 23. Clarke's; lot 12, con. 1, Fenelon township, N. Victoria.

No. 24. Brown's; lot 23, con. 1, Fenelon township, N. Victoria.

No. 25. McKenzie's; lot E. pt. 22, con. 1, Fenelon township, N Victoria.

No. 26. Jamieson's; lot W. ½ 23, con. 2, Fenelon township, embanked.

No. 27. Birch Point; lot B. F. 26, con. 3, Fenelon township, N. Victoria.

No. 28. McArthur's; lot W. P. 26, con. 4, Fenelon township, N. Victoria.

No. 29. Lee's; lots 69-71, con. Front Range, Somerville township, N. Victoria.

No. 30. Winterbourn's; lots 11 and 12, con. 8, Laxton township, N. Victoria.

No. 31. Hilton's; lot 12, con. 7, Laxton township, N. Victoria.

From what has been disclosed this year by personal search and investigation, I am convinced that there was a large semi-sedentary population extending along this ancient highway of waters to Lake Ontario. And from the number of places occupied, the condition of soil suitable to their agricultural operations—generally a light sandy or sandy loam—also the numbers of mealing-stones, the absence of weapons of war and of the chase, I am led to believe that the population was a peaceable one, living upon the products of cultivation, eked out with wild fruits and what game they could get, which would be little in a thickly populated country. It must be borne in mind that this is not essentially a nut-producing territory. Fish, no doubt, contributed largely to their subsistence, and as there are so many different lakes of large areas, systems of rivers, etc., they had the choice of many different varieties of fresh-water fish, such as mascalonge, bass, whitefish, pickerel, salmon-trout, all of large size; and the smaller varieties, such as brook trout, perch, catfish, eels, suckers, sunfish and herring, each in its season. The lack of harpoons and other fishing apparatus, noticeable in the vicinity of rivers and streams of the western part of the Province, may be accounted for by the probable use of the net, as remarked by the Jesuits amongst the Hurons. No doubt they also employed traps and weirs of perishable material, but no permanent ones of stone or earth have been noticed as yet, though some years ago several so-called fish stakes were taken from the narrows at Lake Couchiching, where the Hurons had been in the habit of planting them for piscatorial purposes.

Taking also into account that only one embanked site is known amongst thirty-one examined—and that commanded by high hills—in

an area of twenty-five miles north and south, and twenty miles east and west, is another reason for the belief that these people were peaceable Of course one might raise the objection that the villages may have been palisaded. Now, it was too immense a labor to palisade these villages when the timber had to be cut and dressed with stone tools, aided by fire. With very few exceptions, the general character of the villages here is that they were of a small number of habitations loosely scattered over a large area, and sometimes only a row or so of such along the edge of a plateau or around the margin of a swamp, covering acres of ground. Supposing them to be palisaded, there would certainly not be population in them enough to successfully "man" the amount of palisading necessary to completely surround these straggling villages.

It seems to be a rule not to have had these villages on or near water-courses, but in localities having local features of defence, such as swamps, hills, or approaches through rough country, which were the only natural and perhaps main means of defence they had. Again, the land is generally better suited for purposes of cultivation a little distance back from the lakes than immediately on the shores. Those small sites on the shores being generally considered as fishing-camps, we may say that they wisely chose for occupation localities suitable for cultivation nearest to bodies of water, yet not too close to be observed by enemies travelling by water, and not too far away to be inconvenient to the inhabitants. I have heard about other sites, embankments and mounds which could not be looked into this season, but will be examined next year. The proportion of unfinished relics is rather large, some of them being of material coming from far distant districts.

No corn hills or garden-beds have been noted so far.

The Rock Nation of the Hurons was the most north-easterly of these people, and probably took this route into the country, in which they were found by the Jesuits. The sites here described were, in all probability, those of their abandoned towns in their westerly drift. The other Huron natives separating from the Rock Nation at a point east of here, supposedly at the junction of the Scugog River with Sturgeon Lake, following up the Scugog waters (lake and river) and ascending the valleys to the west drained into the Scugog by Noncon and other creeks, till they came to the region south of Lake Simcoe; rounding the southern end of which they finally stopped in their now known country.

The museum is indebted to those whose names follow for the specimens mentioned in connection therewith. I, also, am under great obligation to the gentlemen for many personal courtesies.

Archibald McArthur, Balsam Grove P.O., gives iron tomahawk, 2 small "skinners," degraded celt hammer and degraded gouge hammer, site No. 28, lot W.P. 26, con. 4, Fenelon.

John Martin, Uphill P.O., iron tomahawk.

Isaac Bowins, Coboconk P.O., celts, soapstone discs, and several unfinished implements, lot 51, Front Range, Somerville.

Jas. Moore, Coboconk P.O., several clay pipe heads, bone awls from site 16, lot 19-20; G. R. R. Bexley

D. Ryckman, Victoria Road P.O., clay pipe from site 1, lot 1; N. P. R. Bexley.

F. Widdis, Bexley, clay pipe.

Jos. Shields, Victoria Road P.O., slick-stone.

Chas. Youill, Thorah twp., N. Ontario, a large square unfinished gorget, Huronian slate, $6\frac{1}{2}$ by $4\frac{1}{2}$ by $\frac{7}{8}$ in., shows pecking and flaking, was one of cäché. See previous Reports.

Wm. Kennedy, Bobcaygeon, triangular slate pendant found on Ball Island between lakes Chemong, Buckhorn and Pigeon, Peterborough Co. Dimensions $2\frac{9}{16}$ x $\frac{15}{16}$ x $\frac{3}{16}$ in., one hole.

Neil Sinclair, Glenarm P. O., French axe, flint curved knife, pottery, celts, very small mealing-stone, and narrow oval gorget, two holed, $4\frac{1}{2}$ x $1\frac{3}{8}$ in., has been broken and re-ground. Lot 25, Con. 3, Fenelon.

Miss A. Campbell, Kirkfield P. O., fragment of clay pipe bowl showing human mask, arms, and fingers defined; perforated *melantho* shells; and small soapstone pipe covered with incised lines, presumably a conventionalized animal head with stem hole entering in the mouth. Site 10, lot 44, S. P. R., Eldon.

D. Brown, Glenarm P. O., a large mealing stone, basined on one side, flat polished surface (metate) on other, polished celt bone and bead. Site 24, lot 23, con. 1, Fenelon.

Jos. Chant, Blackwater P. O, clay pipe-head, found near Sunderland.

Edward Lytle, jr., Victoria Road, yellow soapstone pipe, S. P. R., Bexley. Evidently a conventionalized moose head.

Archibald Ferguson, Glenarm P. O., a polished celt found in Eldon twp., hammerstones, stone and clay discs, perforated and unperforated; bone and fragments of pipes from site 11, Long Point, Fenelon, also hammer stones, pottery, discs, mask, clay pipes, small soapstone pipe carved like a bird, slick stones, perforated soapstone discs, barbed harpoon, and a mealing stone of the metate mortar variety, from site 23, lot 12, con. 1, Fenelon.

Neil Clarke, pottery, bone awls, hammer stones, two large blocked out celts, and new type of harpoon made from a deer horn, spike $3\frac{3}{4}$

in. long, barbed and hollowed up the centre, forming a socket for shaft, then pierced through the two flattest sides about $\frac{1}{3}$ way up, either to insert a pin for holding the shaft or for attaching a cord to be fastened to a float, or the shaft used for float purposes after the fish is struck. Site 23, lot 12, con. 1, Fenelon.

Wm. Hoyle, Long Point, Fenelon twp., a beautiful grooved maul, $4\frac{3}{4}$ by 3 by $2\frac{1}{4}$ inches: a distinct groove encircles it about midway $1 \times \frac{1}{8}$ inches wide and deep. Face of one end is about 2 x $1\frac{1}{2}$ in., the other being $1\frac{1}{2}$ x 1 in., surface polished, material gray granite. This is the first grooved maul from this section.

Jas. Laidlaw, "The Fort," Victoria Road P. O., flint arrowheads, 2 unfinished slate objects, presumably a woman's knife and a gorget, Site 8, head of Portage Road. Also worked flints, fish-bone bead and rounded pebble from "workshop," Ghost Island.

Mr. D. Hilton, Head Lake, two celts, two clay pipe heads of the ordinary decorated style of dots and encircling rings, also degraded celt hammer-stone possessing the peculiar feature of having its edge between two of its opposite corners, thus giving the tool a roughly diamond cross section. Site 30, lot 12, con. 7, Laxton.

E. W. Glaspell, Rosedale P. O., donates the following specimens: large polished celt from Ball (or Bald) Point, Sturgeon Lake; small polished celt, from Ball (or Bald) Point, Sturgeon Lake; small rough celt, lot 9, con. 8, Fenelon; polished bone barbed fishhook from site 23, lot 12, con. 1, Fenelon, of the following dimensions, $2\frac{5}{8}$ in. long by $\frac{15}{16}$ in. across the bend, $\frac{7}{8}$ in. from the extremity of the barb to the exceedingly sharp point; the shank has a knob on top to attach the line. See remarks on barbed fishhooks in Primitive Man, Boyle, p. 73. Dr. Rau's Prehistoric Fishing, p. 128, American Antiquarian No. 6, Vol. 21, p. 345 (Beauchamp's Archæology in New York). Also the following relics from a site on lot 18, con. 13, Tiny twp., two miles distant from Randolph P. O., owned by Mr. W. H. Bowes: Soapstone bead, human head carved from limestone showing a long narrow face with well executed features, neck showing fracture from some sort of base. Head from a clay pipe showing peculiar arrangement of hair in tufts, one on each side of head and one on top somewhat in shape of a liberty cap; head of bird from clay pipe; a score of fragmentary clay pipes showing different types, but corresponding with pipes from this section; two bone beads and bone awl; small flint arrowhead; fragment of sheet brass, and a beautiful sandstone pipe of a narrow elongated, truncated pyramidal form, covered with peculiar patterns of inscribed lines, and of the following dimensions: length, $2\frac{7}{8}$ in., thickness, 1 in., width at top, $1\frac{3}{4}$ in., width at bottom, 1 in., oblong cross-section, stem hole circular $\frac{1}{2}$ in. diameter and 1 in. from top. Bowl

with oval transverse section. Marchenaw creek is near this site and the ash-beds are deep and extensive.

G. Rumney, Coboconk P. O., celts, bone awls and bangles, inscribed hollow bone, small flint arrowhead. Site 14, lot 56, F. R. Somerville.

G. Staples, Norland P. O., clay pipe, and owl pipe carved from soapstone; this pipe belongs to the same class of totem pipe sculpture as the eagle, bear, panther and wolf pipes, see Report 1890-91; shows evidence of much use and bears a scratch or so from the blow which turned it up. The diagnostic features are well defined, and the treatment of eyes, talons, tail and wing feathers is remarkably acute, the eyes being bored with tubular drills of two different sizes. The bowl being behind the shoulders, and the stem-hole half way down the back. The occiput is pyramidal in shape, and as nothing marks the tufts of feathers which gives the name to the great horned owl, so this may represent either the barred owl or the great gray owl, both species inhabitating this region at various times. Length, $4\frac{1}{4}$ in.; greatest thickness, $1\frac{1}{4}$ in.; greatest width, from beak to shoulders $2\frac{5}{16}$ in. From site 30, lot 12, con. 8, Laxton.

G. Lytle, editor *Watchman-Warder*, Lindsay, pottery from site 29, lot 69, F. R. Somerville.

G. Winterbourn, Norland P.O., adze with a very good edge, site 30, lot 11, con. 8, Laxton.

Wm. Halliday, Head Lake, pottery, celts, hammer stones, etc., from site 30, lot 11, con. 8, Laxton.

Alex. McKenzie, Glenarm P.O., gives gouge, celts and rounded pebbles, from site 25, lot E. pt. 22, con. 1, Fenelon.

Besides above, other known sites were visited and amongst the usual relics gathered up may be mentioned a small triangular arrowhead of very neat make, a very fine bear-tooth knife, some polished soapstone perforated discs, a bone bead still showing bands of red dye very plainly; an unmistakable toy pipe, a peculiar flint tool, 2 in. long, narrow and thick, with very obtuse side edges, front end showing marks of use; may be a flaker; site 3, lot 5, con. 5, Bexley.

Some large bone awls and a very small bone bead, also a very small stone bead, and a cylindrical shell bead made from the columella of a tropical shell, $\frac{5}{8}$ in. long. A very neatly moulded clay disc bead, with an incised edge (perimeter) made before baking. These last three beads are the first of their types known here. An unfinished mealing stone, the latter presented by Mr. W. C. Perry, late of Kirkfield; all from site 2, lot 22, con. 3, Eldon.

Blocked out discs, small soapstone bead, bear-tooth knife, beaver-tooth knife, and a very beautiful bone awl of unique form as follows: total length, $4\frac{1}{2}$ in.; length of awl proper, $2\frac{1}{8}$ in.; the handle is

broadened out to ½ in. wide, and divided into two parts by a waist, the upper part having two notches on each wing and the lower part three on each wing, all beautifully rounded and polished. One side of handle is flat with two rows of very small dots, the other "keeled," with two rows of similar dots on each side of keel. From site 10, lot 45, S.P.R., Eldon.

Amongst other material from site 7, lot W. ½ 6, con. 2, Bexley, is a small fragment of a pot-lip angle, ornamented on the outside by a rough human mask. This is the second case of a pottery mask from this vicinity. See Bulletin, N.Y. State Museum, on earthenware.

A clay stem, 2½ in. long, had a moulded chamber in the larger end, looked like a cigar-holder. This may have been a sort of a straight pipe, but unfortunately it was mutilated before it was secured; locality lot 45, S.P.R., Eldon.

A rough leaf-shaped implement of brownish material, having the appearance of a paleolith, and a rounded worked pebble. Site 8, head of portage, Bexley.

Rounded, oval, circular, ovoid pebbles, still keep turning up in numbers on the new sites.

NOTES ON

SITES OF HURON VILLAGES

IN THE

TOWNSHIP OF TAY (SIMCOE COUNTY).

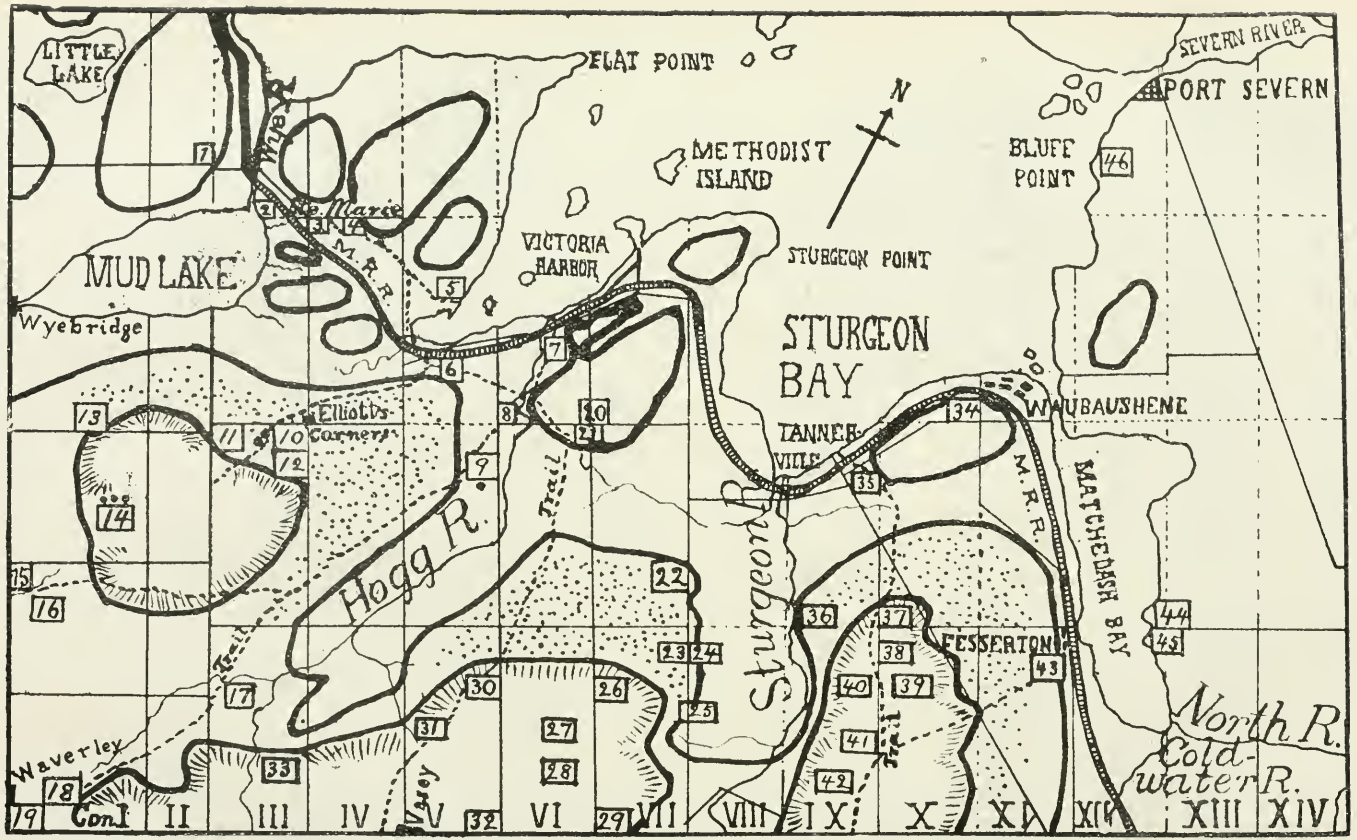
BY ANDREW F. HUNTER, M.A.

PREFACE.

In the preparation of the following Report it did not appear necessary to change the plan adopted in my similar report on the archæology of the Township of Tiny, issued by the Education Department last May. By following in the main the same method, viz., putting the notes into the form of a catalogue of the village sites, the one becomes a continuation of the other, and they may be preserved together by students of the history and archæology of our Province. Separate copies of this Report on Tay have been prepared for the use of those who received my former report on the Township of Tiny.

A. F. HUNTER.

Barrie, Ont., November, 1899.



ARCHÆOLOGICAL MAP OF THE TOWNSHIP OF TAY.

EXPLANATIONS.—The small squares indicate the village sites: each enclosed number refers to the description in the text. The heavy dots at Nos. 9, 10, and 14 indicate the bonepits. Dotted lines show the courses of forest trails (now obliterated). The three dotted patches show the positions of boulder-stone tracts devoid of village sites. The heavy curving lines show the positions of two abandoned lake beaches, and these give the altitude of the land: (1) the higher or Algonquin beach is fringed internally to show the higher hills, (2) the lower or Great Nipissing beach encircles many extinct islands.

INTRODUCTION.

Physical Features of Tay.

Like the adjoining township of Tiny, the surface of Tay consists mainly of parallel ridges with rivers between them. There is this difference, however; in Tiny most of the ridges lie entirely within the township, but in Tay only the ends are found. One of them crosses the boundary into Tiny, the other two pass southward into Medonte. For convenience I will call the former, which lies between the Wye and *Hogg rivers, the Victoria Harbor ridge, because it ends near Victoria Harbor. The next one, lying between Hogg and Sturgeon rivers, will be called the Vasey ridge, from the name of a village upon it. And the most easterly ridge, between Sturgeon and Cold-water rivers, will be named the Rosemount ridge, from the name of the schoolhouse on its summit. Those parts of the township which lie east of Matchedash bay are rocky—Trenton limestone and Laurentian granite.

For showing the altitude of the land I know of no plan equal to mapping the abandoned beaches. This method has a very important advantage; a person can note by direct observation the lines of equal altitude in these extinct shorelines without going to the trouble of making a detailed survey by the use of levelling instruments. Accordingly, I have observed their positions throughout the township, noting the farms in which they appear, and I give the results of these observations in the accompanying map.

The highest of these old shorelines is the Algonquin beach, which has an altitude of about 250 feet above the present level of Georgian Bay. It is a stupendous freak of Nature—an indelible mark on the face of the country—representing the expenditure of an immense amount of force by strong waves in the removal and assortment of materials. The Algonquin Sea that formed it, washed away such quantities of movable material (clay, sand and gravel) from the exposed northerly ends of the ridges that large tracts of boulders are left. It picked the bones of the ridges as it were and left them bare. A large tract of this kind lies immediately south and east from Elliott's Corners, and similar tracts occur on the Vasey and Rosemount ridges. No Huron village sites occur in these uninhabitable stony tracts.

About 100 feet lower is the main beach of the Great Nipissing series, or about 150 feet above Georgian Bay. To give all four beaches

*I am informed that this river is so called from an early Methodist preacher among the Ojibways.

of this Nipissing series would make a complicated map and would involve endless and unnecessary work. So I have mapped only the most strongly marked one of the series. The name "Great Nipissing" has been given by geologists because the outlet of this great lake to the sea, before the birth of Niagara river, was by the present and lesser Lake Nipissing and French river.

At the ends of the above mentioned ridges there were islands standing out from the mainland in the Great Nipissing sea or lake. One of the largest of these extinct islands lies in a south-easterly direction from the outlet of Hogg river, and is a tract of isolated high ground covering an area of 500 acres or more. Before the forest was cleared away these extinct islands were separated from each other and from the ridges by thickets.

The advantages to the study of the subject, gained by introducing these references to the old lakes and beaches, consist merely in the ease with which they give the altitude of the land throughout Tay, and thus elucidate its physical features. They have no connection with Huron occupation, except in so far as village sites are often found near the springs that issue along those old lines. The heavy curving line in the map denotes the Great Nipissing beach; that with fringe, internally, showing the hills, is the Algonquin.

The roads, also, and road allowances are marked on the map, so that the reader can adopt a scale for any measurements he may require. In that part of the township called the Old Survey, which consists of Concessions One and Two, the sideroads are placed at every fifth lot, and are a mile and a quarter apart (100 chains). The lots in the First Concession are a mile and a quarter deep, but those in the Second have a depth of only one half of that amount. Concessions Three to Fourteen make up the New Survey. These are five-sixths of a mile wide ($66\frac{2}{3}$ chains) and have sideroads at every fifth lot, or a mile and seven-eighths apart (600 rods). Bearing these measurements in mind, a reader may readily calculate any distance. The lots are numbered from the south in both old and new surveys. The upper corner of Tay is omitted from the map, but will be found in our Report on the Township of Tiny.

Altogether, I will give descriptions of forty-six sites. The plan of proceeding will be to begin at Mud Lake and proceed southerly and easterly through the township.

The Village Sites.

The village sites described are only those known to the writer up to this date, without any claim to completeness, which in the present state of the subject would be impossible. Much sameness will be

found in the descriptions of these, especially the villages upon the higher ground of the Vasey and Rosemount ridges. Some readers may be ready to censure me for this apparent defect, but the fault is not mine. There would be variety enough if farmers and others had noted facts with more minuteness than they have done. But, as a rule, they have observed only the most general features. Hence the sameness in the descriptions is due to the character and present stage of advancement of the subject with which we have to deal.

Some of the so-called villages, especially those on the lakeshore, have been mere camping grounds where successive generations of Hurons and other sedentary tribes of the interior camped from time to time when on fishing and other expeditions; and such places now have the appearance of villages. These lakeshore villages, after being Huron landings, became Algonquin camp-grounds, the result being a mixture of relics on these spots that defies classification. Such places are found beside the sheltered bays and harbors along the shore, while the landings at points (very few of which we have attempted to record) are quite recent and were chiefly used by modern Ojibways.

It will be noticed that only a few bone-pits occur at the Huron villages of Tay, and these are confined exclusively to the Victoria Harbor ridge, which doubtless was the abode of that "Nation" of the Hurons called the "Ataronchronons." On the Vasey and Rosemount ridges there are bone-pits, though these are not in Tay, but are found farther south in Medonte township.

Still another feature is brought out in our survey of the township for village sites; and if our collection of data makes any approach to being exhaustive, the feature may be received authoritatively. This is the numerous distribution of small villages within easy reach of Sturgeon River, along both sides of it. It appears to show that the river was a resort of the Hurons, which may be accounted for by the fact that it was a good fishing ground. It has sedgy banks and accordingly was a favorite haunt of fishes of the ganoid and pike families, as its name indicates.

The Historic Side of the Subject.

In so far as these Notes have any historic significance, it will be readily seen that their chief feature is our attempt to throw some light upon the positions of those early missions of which Ste. Marie was the centre; and, more particularly, to find the village of St. Louis, where Brebeuf and Lallemant were captured, and also St. Ignace where they were put to death. Besides the Fort of Ste. Marie on the Wye, partly protected by masonry and partly palisaded, the villages numbered 4, 6, 8 and 12 in our list show evidences of palisading; and from other con-

siderations, these four may be regarded as belonging to the very latest Huron period. Other villages may have been palisaded likewise, but these are the only ones of which I have certain evidence. It will be most natural, therefore, to seek for the palisaded villages of St. Louis and St. Ignace among these four. On the various points arising out of these questions, however, it is not intended to offer our suggestions as anything more than plausible conjectures.

One of the first persons to investigate the situations of the Jesuit missions appears to have been the Rev. P. Chazelle, who visited the district in 1842. Some years later (in 1855) the Rev. Felix Martin also made a tour of exploration in Huronia. It will be most suitable, in this connection, to quote from the brief account of this tour contained in a biographical sketch of this painstaking investigator:

"The aptness of Father Martin as an antiquary was known by the men in the Government and the Hon. George E. Cartier entrusted him with a commission to explore, on the spot, the site and the remains of the ancient Huron missions in Upper Canada near Georgian Bay. By care Father Martin found the traces of the ancient posts of the Jesuits in that country where they had so many martyrs; he collected many Indian relics, he afterwards made a work embellished with plans and drawings, the whole having been deposited at the seat of Government."

The next investigator was Dr. J. C. Taché who undertook some further exploration of Huronia at intervals in five years prior to 1865. Parkman, in his works, has quoted these archæological researches of Taché, and thus has given wide currency to Taché's views of the positions of the mission sites.

It appears to have been Father Martin who fixed upon a village site on Fox's farm in Medonte township as that of St. Ignace; and in this belief Dr. Taché afterwards examined the site somewhat minutely. This early decision as to what place was the scene of the tortures of Brebeuf and his companion received wide acceptance through Parkman's publication of this as the true position without any doubt. But it is certainly incorrect, and the best informed students of the subject have refused to recognize the claims of Fox's farm, as its distance from Ste. Marie is much greater than the written descriptions justify.

In Taché's time there were comparatively few sites known. Since then, however, much new knowledge has been won, and a solution of the problem of finding St. Ignace, as well as the other mission sites, has become possible. It may involve more labor than the first investigator anticipated, but reliable conclusions have become more attainable. This is chiefly due to the fact that the greater part of Tay has been settled since Taché visited the district. The first settlers of the Vasey Ridge went there about thirty years ago; those on the Rose-

mount Ridge, about twenty-five years ago. We now learn from these settlers the characters of the village sites there. They had no palisades, and accordingly St. Ignace was not one of the villages on these ridges. Fox's site was chosen through the uncritical use of Ducreux's map, which shows the St. Ignace of about 1640. For the purpose of clearly distinguishing these two places, it has been decided to call the one we are now seeking, St. Ignace II.

Neither can Ducreux's map be taken as a guide for the St. Louis of 1649, as it shows the position of the one of about 1640. Throughout the text of this report, I have called the one of later date, St. Louis II.

As regards the distribution of the other mission sites as laid down by Ducreux, I am inclined to believe that each mission marked a district isolated by physical features; and whether we assume the villages in a group to have been contemporary with each other, or to have been the same village at different periods, each group of villages so divided physically seems to have had its mission. The Rosemount Ridge, for example, would naturally be the care of one of the missions marked St. Jean and St. Joachim.

The Forest Trails.

The physical features also govern the courses of the forest trails, which, so far as I have located them, are shown by the dotted curving lines on the map. As one may also see from the map, the continuous high ground, along which trails could be made, makes its nearest approach to the Georgian Bay at the head of Victoria Harbor. Here, then, was the commercial centre of the Hurons, as it has also been of later Algonquins. In other words, the physical features of the district were such that Victoria Harbor became naturally the focus or centre of population, the trails radiating from the head of the harbor in several directions inland along the higher ground. It appears to have been this very centre, the heart of the country, that was smitten in 1649; otherwise the Hurons would not have so precipitately deserted their country after the capture of only two of their villages, had these villages been of the ordinary unfortified kinds.

Amongst the results expected from the publication of this report, it is hoped to correct a number of popular errors and wrong impressions that are unduly prevalent in the territory with which we have dealt. There is, of course, the usual tradition of "buried treasures," always to be found in connection with historic reports, and in this locality it is even more rife than elsewhere. Many intelligent persons

are impressed with the idea that treasures have been buried at these historic places, whereas in reality there is nothing more precious to be found than chips of old brass kettles or worn-out tomahawks. But the belief in "treasures" is deeply rooted, and in a few places it even results in reticence when information is sought, and thus obstructs the course of guileless scientific enquiry. As a rule, however, the farmers of Tay, as elsewhere, have been extremely courteous while I was prosecuting my enquiries: and it is hoped that the report will further stimulate them and others to observe closely the Huron remains in their respective neighborhoods.

Of wide prevalence is the erroneous opinion that Fox's farm in Medonte had the site of St. Ignace II, where the two early missionaries were tortured to death by the Iroquois. Father Chazelle's earlier choice of a site on Sturgeon River for St. Ignace has almost been lost sight of by the acceptance of the Fox farm theory. But his theory of Victoria Harbor as the site of St. Louis still lingers, and with a slight change it becomes the truth. The regarding of the human bones found at the site on Sturgeon River as the remains of Brebeuf and Lallemant, is an opinion still current with a few of the older persons. But the opinion that "The Chimnies" on the east side of Matchedash Bay were early French structures, is now almost obsolete. Such errors as these, it is hoped, will be finally eradicated by the perusal of these notes.

DESCRIPTIONS OF THE VILLAGE SITES, ETC.

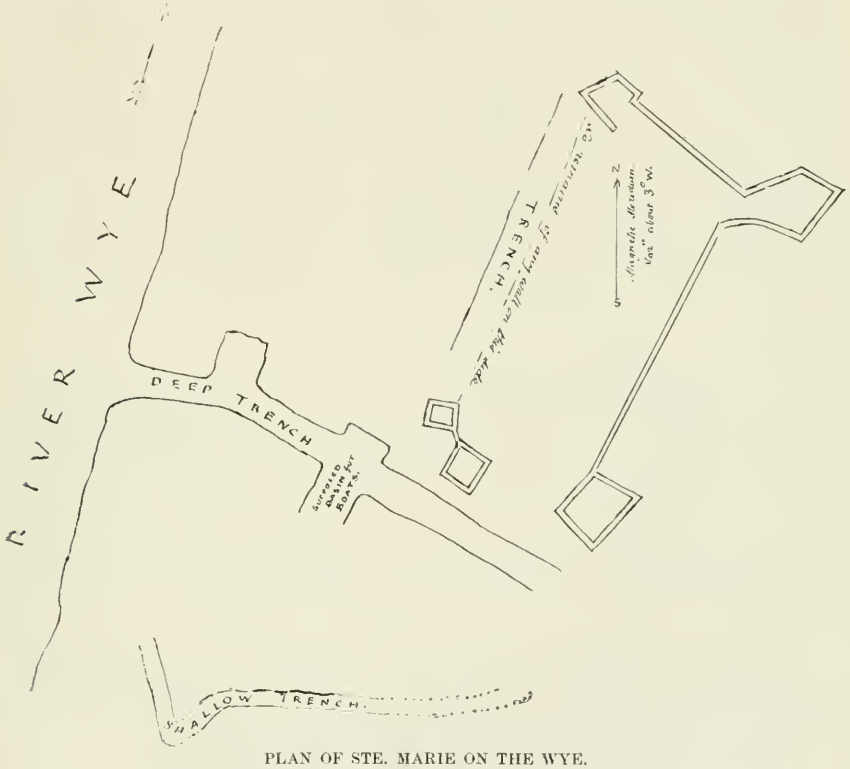
1. Samuel D. Frazer's.

On the east end of lot 101, concession 2, (Samuel D. Frazer, Esq., owner), Huron camps have been found scattered over an area of five or six acres. Mr. Frazer has lived here since 1839, and has been a close observer in everything that has pertained to the aborigines, as well as in other matters. He states that cornhills were numerous near this site at the time the land was cleared. These cornhills were of the large kind described in our Report on the township of Tiny, page 13. Relics of the usual kinds have been found, and also a few others less common, among which was a discoidal stone measuring an inch and three-fourths in diameter and five-eighths thick, slightly pitted near the middle on each side. This was presented by Mr. Frazer to the Provincial Museum, and is No. 16,702 in the archæological collection. Mr. Frazer has befriended the science of archæology in other ways, more especially by the presentation to the museum of a sword, dated 1619, also found in this neighborhood. The position of this village

doubtless indicates the direction taken by the trail that led westward from Ste. Marie.

2. Ste. Marie on the Wye.

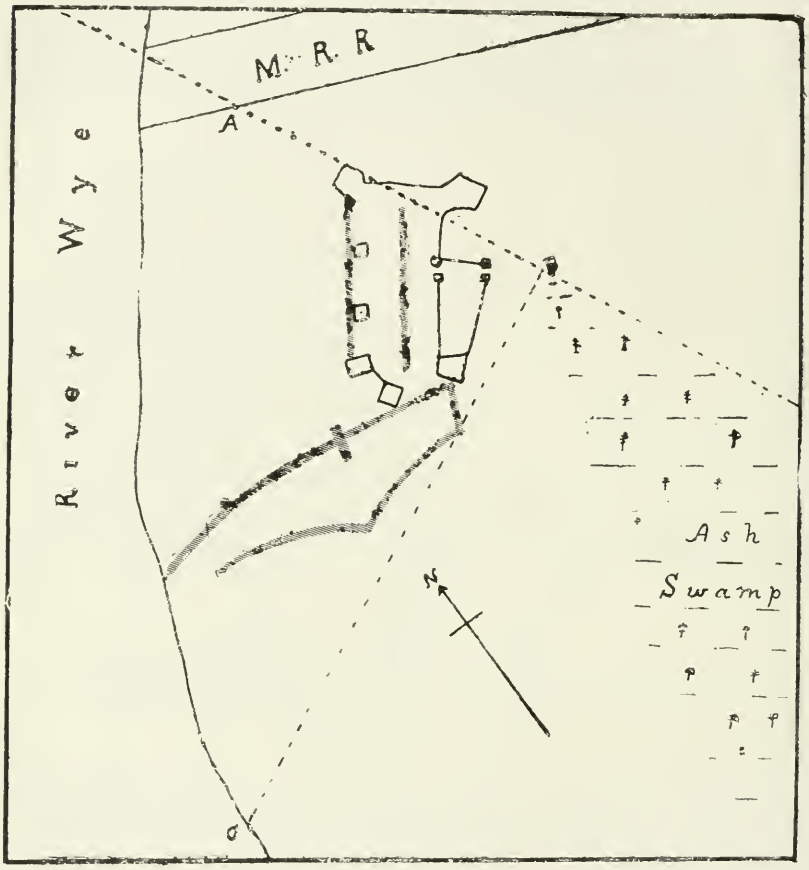
The ruins of Ste. Marie, the fortified mission built by the Jesuits in 1639 and occupied by them for ten years, may be seen on lot 16, concession 3. It was a stone fort and is the most noteworthy object of historic interest in Huronia, though in its present crumbled condition it can be called only a ruin of a ruin.



PLAN OF STE. MARIE ON THE WYE.
By the Rev. Geo. Hallen (in 1852).

While preparing these notes, I was favored by Mr. Edgar Hallen, of Orillia, with the use of a plan of Ste. Marie made in 1852 by his father, the late Rev. Geo. Hallen. With his permission the annexed engraving has been made—a special favor that will be of much value to students of history generally, as the present condition of the fort scarcely admits of the making of a definite sketch. Although the small tracing of the fort in Father Martin's Montreal edition of Bressani's Relation was copied from this plan of Mr. Hallen's, it lacks a number of details given in the original sketch.

The author of the sketch wrote a note thereon that is worthy of our attention: "In the (easterly) Bastion, is an instance of the flank of a bastion being curved with its convexity towards the interior of the work, instead of being rectilinear." The original sketch also furnishes us with means for the measurement of the dimensions of the



Plan of Ste. Marie on the Wye (1876)
By Peter Burnet, P.L. Surveyor
AB is the line between east and west halves of Lot 16.
BC is the northerly line of demarcation of an acre in the west half, having a separate ownership.

fort. The curtains on the two sides fortified by stonework are approximately 110 and 57 feet in length: while the extreme measurements in straight lines along the same sides (*i. e.* including the widest reaches of the bastions) are about 165 and 110 feet. The distance from the fort to the river is 44 yards. The trench along the southerly

end is not continued in the diagram beyond the stonework, but some have observed this to be continued in a southeasterly direction to Mud Lake, thus giving double access for water coming into the trenches. In the event of a siege, if one course should be stopped the other might be kept open.

As every observer will invariably record features that do not "strike" another observer acting independently, it may be interesting to compare Mr. Hallen's plan with one made by Peter Burnet, P. L. Surveyor, who sketched the place in 1876. The latter plan, which also belongs to Mr. Edgar Hallen, includes all the environs on the west half of lot 16, but we reproduce therefrom only the fortification itself.

It is not my intention to give an extended description of the fort here, as it has often been described in accessible books. I will add a few bibliographical notes for the guidance of those readers who may wish to pursue the subject further. The carefully prepared description by the Rev. Felix Martin in his Life of Jogues is worthy of the reader's attention, as he visited the place in 1855, when the fort was in a more complete condition than it is in at present.

Bibliography.

Adam, G. Mercer. Georgian Bay and the Muskoka Lakes. (Picturesque Canada, Vol. II., Toronto, 1882).

At page 582 there is an account of Fort Ste. Marie on the Wye and the Hurons.

Bain, Jas, jr. The present condition of the old French Fort at Ste. Marie. (Proc. Canad. Institute, 3rd Series, Vol. III., 1886, pp. 278–279).

Boyle, David Ste. Marie. (Fourth Annual Report of the Canad. Institute--Appendix to Report of the Minister of Education—Toronto, 1891).

The notes on Ste. Marie, at pages 18 and 19, deal chiefly with its present condition.

Bressani F. J. Relation Abrégée. (Montreal, 1852. Edited by the Rev. Felix Martin).

Has various reference to Ste. Marie. It contains also at page 333 some notes by Father Martin on the ruins of Fort Ste. Marie, with a small plan of the fort.

Charlevoix, Francois X. de. History and general description of New France.

In Book VII. there is a description of Ste. Marie.

Harvey, Arthur, and Alan Macdougall. Forty-third Annual Report of the Canad. Institute. Transactions, 4th series, Vol. 3, 1892.

A reference to the excursion made to Ste. Marie on Sept. 28, 1891, mentions the features of the fort recognized on that occasion, including the "water gate."

Hunter, A. F. Note on Ste. Marie on the Wye. [Burrows' Reissue of the Jesuit Relations, (R. G. Thwaites, Editor), page 269, Vol. 19, with sketch map at page 270].

Lalemant, Jerome. Relation de ce qui s'est passé en la mission des Hurons, (June, 1639 to June, 1640).
Chap. IV. De la residence fixe de Sainte Marie.

Martin, Rev. Felix Life of Jogues. Appendix A. contains a carefully written description of Ste. Marie, which Father Martin visited in 1855.

Parkman, Francis. Jesuits in North America.
In Chap. 25 there is a lengthy description of Ste. Marie.

3. John McDermitt's.

Remains of a few camps have been found on the northwest corner of John McDermitt's farm, the west half of lot 15, concession 4. The indications are that this was a small village, having no palisades,—the few scattered lodges having been placed there because of some springs. The position shows the probable route taken by the Huron trail that led from Ste. Marie eastward. This lay along the south edge of some elevated ground (islands in the extinct Great Nipissing Lake)—the district immediately south of this trail having been occupied in Huron times by hummocks surrounded with thickets and by small streams flowing into Mud Lake, the ground there being accordingly unsuitable for much travelling.

4. The Probable Site of St. Louis II.

At another part of Mr. McDermitt's farm (lot 15, concession 4) there is a much larger accumulation of blackened soil and ashbeds, mixed with relics. The site is near the line between the west and east halves of the lot, but a little way into the east half. It is situated on a hill, almost, if not quite, surrounded by low ground; and on account of occupying such a position, it is evident *prima facie* that the village had been palisaded. From this place to Ste. Marie the distance is about a mile. Just west of the site rise some springs from which the

village had been plentifully supplied with fresh water. One man, while ploughing on the site a few years ago, found an earthen pot (which broke on being disturbed), and in it were six iron tomahawks. Northward from the village there was a graveyard containing a few burials, which, so far as observed, were of the isolated or single type The skeleton of a person of very large proportions was found among these. Angus McDermitt, a brother of the landowner, counted twenty lodges at the site, the ashbeds of camp-fires, etc., being in some places as much as three feet in thickness.

It is probable the site is that of St. Louis II., the second village taken and burned by the Iroquois in March, 1649, and the one at which the Jesuit missionaries, Brebeuf and Lallemant, were captured, being led thence to St. Ignace, where they were put to death. Among the considerations that lead up to this conclusion are the following :—

(*a*) The size estimated by Mr. McDermitt, viz., twenty lodges (reckoning the usual number of four or five families to every lodge), would be nearly the size of St. Louis as recorded by the Rev. Paul Ragueneau. According to that chronicler, about 500 Hurons had forsaken the place at the first alarm, leaving 80 warriors to fight the Iroquois.

(*b*) It was on the only route from Ste. Marie eastward to Victoria Harbor, the commercial centre of the Hurons hereabout. As we pointed out in our description of the preceding site, the ground immediately south of this trail was not suitable for travelling; and so far as it has been examined, it yields no traces of villages or trails.

(*c*) The relics found at this place are of such kinds as to show that it was a village of the very latest period of the Huron occupation of the district. The existence of palisading also tends to prove the same, because, farther back in the country, the Huron villages of earlier date seldom had palisades. Of all the fortified villages belonging to that latest period yet found, this is the nearest to Ste. Marie.

(*d*) As to the distance of St. Louis II. from Ste. Marie, a little apparent diversity in the evidence furnished by the records confronts us. Ragueneau gives us the distance as not more than a league (two miles and a half); but Regnaut explicitly makes it much less. The latter writer uses the name "St. Ignace" (really applied to the mission among all these villages, as Ragueneau also tells us) for the village to which the two missionaries had set out, and does not mention the name "St. Louis." He gives the distance as "a short quarter of a league" from Ste. Marie. The site under consideration, therefore, is not at variance with the conditions prescribed by either writer.

(*e*) Wherever situated, it is a fact that St. Louis II. could be seen from Ste. Marie, as all the writers agree in stating that those in the

fort could see the burning of the village. This furnishes a well-authenticated test. From observations made upon the ground, I found that, looking eastward from Ste. Marie, the only place where spectators could see a fire in the distance was at this very site. A small tract of elevated ground, rising out of evergreen thickets, closes the view from Ste. Marie toward the southeast, and disqualifies the sites farther along the trail at the head of Victoria Harbor from being the place we are seeking. It is quite true that, in a southerly direction, had there been a conflagration at site No. 10 on the high ground of the interior, it might have been seen from Ste. Marie across the edge of Mud Lake; but No. 10 as well as the adjacent sites Nos. 11 and 12 connected with it, although regarded by some as St. Louis II, have failed to satisfy other conditions.

This discussion of St. Louis II would be incomplete without some references to the views held by others in regard to its position.

Father Chazelle who visited the locality in 1842 appears to have been the first to form any opinion on the subject. A fishing village at the mouth of Hogg River (No. 7), the landing place for the villages of the interior, was the only site then known in its neighborhood; and he fixed upon it as the site of St. Louis II. Father Martin and other enquirers followed him in holding this opinion. This, however, was determined in accordance with the diagram of Huronia in Ducreux which, as they failed to perceive, shows the earliest position of St. Louis, as we have already pointed out in the introduction.

Others have regarded the site No. 10 as the place. This opinion, however, seems to have been the result of the finding of a very large bonepit there, suggesting to the popular mind that a massacre had taken place, and recalling the fight at St. Louis II. To those who understand how a bonepit was formed among the Hurons, viz., by the accumulation of human bones for a period of several years, the finding of this pit proves exactly the opposite of a massacre; in fact, it furnishes a good proof that the site was occupied in time of peace and was not St. Louis II. In other respects, also, the site forbids the idea that it was the captured village.

Again, the site on the Evans farm (No. 6) has presented some probable indications, and the reader is referred to our description of it for fuller particulars. But a strong objection to the Evans site lies in the fact that it was hidden from Ste. Marie behind some high ground.

5. Ney's.

On the west side of Victoria Harbor, some aboriginal remains have been found on lot 14, concession 5. These remains consisted of the

usual pottery fragments and other relics in ashbeds. Many caches or empty pits are at the site. There is also a patch of second-growth trees—what is called an "Indian clearing;" but this phenomenon may be partly due to the beds of gravel, so much of which is to be found there that the Midland Railway has an extensive "Gravel Pit" near it. But it may also be at least partly due to actual clearing, as the ancestors of some of the present Ojibway Indians at Christian Island are said to have grown their corn at this place, and lived here. It must also have been a landing-place for the earlier Huron Indians.

6. Evans'.

A Huron village site exists on the Evans farm, the west half of lot 12, concession 5, at a short distance from the shore of Victoria Harbor, and on the elevated ground of an old lake terrace. It is now almost obliterated by the farm buildings, orchard and garden, and its first appearance when the ground was new is difficult to get correctly recorded. But the late Wm. Evans, who first settled this place, and whose family still occupies it, gave Mr. A. C. Osborne an account of what he found, and to Mr. Osborne I am indebted for the following description:—"Mr. Evans built his log house many years ago, and in digging the cellar found about six feet of ashes. Large clumps of cherry trees, remains of corn deposits in birch bark, charred remains of palisades, large numbers of tomahawks, knives, stone implements, and relics of various kinds were also found. The site is admirably adapted for defence on one side only."

From the scanty evidence that has come before me, I have been able to conclude that this village, although occupied during the time of the French traders, did not belong to the very latest period. It is not in full view of Ste. Marie, and accordingly cannot be regarded as St. Louis II, because the burning of that ill-fated village could be seen by the spectators at Ste Marie.

A short way to the southward of this village site, the ground makes another abrupt rise, the faces of the steep hills being covered with berry patches. On the highest plateau was the cornpatch belonging to the village. This is situated on the northwest quarter of lot 11. Wm. Maughan, the owner, has found many cornhills on his land. There is an excellent view from this high ground, overlooking Victoria Harbor and the more distant islands.

7. Vent's.

At the mouth of Hogg River there is the site of a village, occupied, doubtless, by Hurons as well as by Algonquins of later times, as the

shore of Victoria Harbor was a favorite resort of Indians until within recent years. Its position at the end of a trail shows that it was a fishing village, and a "port of entry" for the villages of the interior. It is situated on the east bank of the river, on lot 13, concession 6, (Geo. Vent, owner). Pottery fragments were ploughed up here, and other relics, including two double-barred crosses, a large one and a small one. The crosses were found many years ago by one James Maloney while ploughing for the occupant of that time, James Coyle, and were presented to the Rev. Father Charest of Penetanguishene. The site belonged to the earliest Huron period as the pottery fragments go to show, but the double-barred crosses had a more recent origin, probably in the eighteenth century.

This site has acquired some importance from the fact that it was known as early as 1842, when the Rev. Father P. Chazelle, S.J., visited it in the belief that it was St. Louis II. This was an erroneous view as we have elsewhere said, but it was evidently due to the fact that there was no other site then known, and to the acceptance of Ducreux's map as a guide for the positions of the missions in 1649. It was, however, a close approximation to the true position, as the reader may infer from the facts as now understood.

By following the trail up the east bank of the river a little way, the men with Father Chazelle found trees marked with Indian "blazes." One, a large elm, was marked with a cross, probably to show the forking of the trail at the place. This was at the so-called "Indian clearing" on lot 12, shown in our diagram of the next site.

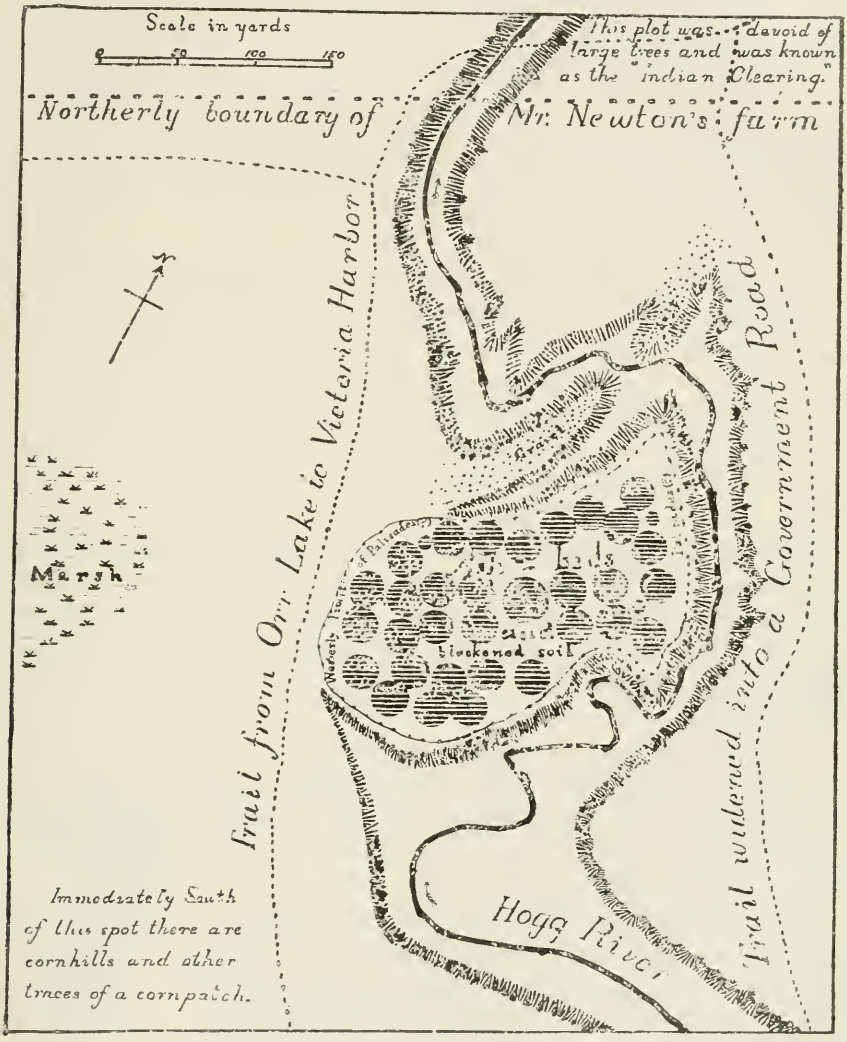
It may be of some interest to add that Father Chazelle, when on this early expedition to Hogg River, held an open air meeting (either at the "Indian clearing" or at the outlet). He preached to a concourse of settlers on the subject of the massacre of the early missionaries.

8. The Probable Site of St. Ignace II.

Through the farm of Chas. E. Newton, Esq., the west half of lot 11, concession 6, the Hogg River has cut a couloir or path in the old lake bed deposits to a depth varying from fifteen to twenty feet. In this part of its course the river makes a loop something like the letter U, which encloses an ideal spot for a village requiring means of defence.

Hurons selected for one of their villages this plot of ground, containing four or five acres, in the bend of the river. This ground is covered with ashbeds and blackened soil, mixed with relics. The latter consisted of iron tomahawks, knives, pieces of metal probably cut out of worn-out brass kettles, and pottery fragments in endless quan-

tities. All these relics show that the site was one of those occupied down to the very latest period of the Huron occupation of the district. There are empty caches at the site, and a pottery just south of it, where the clay is of good quality for plastic work. Mr. Newton has experimented successfully in making terra cotta from the same clay


Scale in yards
50
100
150
This plot was... devoid of large trees and was known as the "Indian Clearing."
Northerly boundary of Mr. Newton's farm
Trail from Orr Lake to Victoria Harbor
Trail widened into a Government Road
Marsh
Blackened soil
Hogg River
Immediately South of this spot there are cornhills and other traces of a cornpatch.

THE PROBABLE SITE OF ST. IGNACE II AND ITS ENVIRONS.
WHERE BREBEUF AND LALLEMANT WERE PUT TO DEATH, MARCH, 1649.

What appears to have been "the village corn patch" occurs near the house of Wm. Bennett on lot 10, and it may have extended as far north as the site itself, though the cultivated ground no longer shows any traces of the corn hills. From this site to Ste. Marie the distance is 3½ miles.

A trail comes from Orr Lake by the way of Waverley, and just before reaching this place is divided into two strands, one passing down each side of the river. These meet again at the "Indian Clearing" on lot 12, which we mentioned in connection with the last site. The trail down the east side as far as the "Indian Clearing," and thence to the mouth of the river, was widened, many years ago, into a Government road, now disused.

It is probable the so-called "Indian Clearing" is due to the gravelly soil, which would not permit of the growth of trees, rather than to actual clearing by the aborigines. But, whatever its origin, it was certainly a resort of the Indians, the fork in the trail having been here. These trails were used by them until recent years when the erection of fences obstructed their course.

The plot of ground in the bend of the river has been called the "Jesuits' Field" for many years, but by whom it was so-named is not known to Mr. Newton. Nor has my enquiry so far elicited any explanation of the name, unless it became connected with the place from the visit of Rev. P. Chazelle, S.J., to the neighborhood in 1842, as described in the account of the last mentioned site. It is not evident, however, that he visited this plot on the west side of the river.

This spot has also the usual traditions of buried treasure, in even greater numbers than elsewhere, if that were possible. Thus, the Rev. J. H. McCollum, rector of St. Thomas, Toronto, who was here at the opening of the Anglican church in 1896, makes a reference to one of these traditions in his account of the place written for the *Canadian Churchman*:—

"This happy valley was once the scene of terrible encounters between the Hurons and the savage Iroquois; and in this valley the early missionaries to these unhappy red men buried the sacred vessels of their church to save them from destruction. The place is known as the 'Jesuit's Meadow' to this day."

It is probable this site in the river's bend was St. Ignace II., the first Huron village captured by the Iroquois in the early morning of March 16, 1649, and the place to which Brebeuf and Lallemant were brought, a few hours later, and there tortured to death. Its distance from Ste. Marie coincides pretty well with the records, all the writers agreeing that it was less than two leagues (five miles), and about a league from St. Louis, which, in my opinion, was the site at Mr. McDermitt's (No. 4).

But the strongest evidence is in the configuration of the ground. Rev. P. Ragueneau's account of the place (Relation, 1649) suggests a

plan of the village and its surroundings, and tells us beforehand of what appearances we may expect to find there. He says:—

"It was surrounded by a palisade of posts from fifteen to sixteen feet high, and by a deep trench (fossé), with which Nature had powerfully strengthened the place on three sides, a small space alone remaining weaker than the others. It was through that part the enemy forced his entrance."

While this description of St. Ignace II. will suit, in some measure, almost any palisaded site, because these were, as a rule, placed on a spur of land, the completeness of the fortification, effected by Nature in this case, was such as to attract the attention of the chronicler who wrote the description just quoted. After a diligent search through the sites of the district, I can find none that so exactly agrees with this description of St. Ignace II. as this site on Mr. Newton's farm.

9. Hutchinson's and Taylor's.

A village site on the farm of John Hutchinson, the east half of lot 10, concession 5, extends into the adjoining farm of Levi Taylor, lot 9. In a field of twelve acres at the south side of Mr. Hutchinson's farm he has found these camps chiefly along the foot of a hill, against the face of which the abandoned beaches of the Great Nipissing Lake are strongly marked. There is nothing in the appearance of these straggling camps to indicate that they had been palisaded. The village was plentifully supplied with water: a spring issues just north of what was the most thickly populated ground; and the Hogg River is divided into two parts at the front of the farm, one part flowing near the site. The ashbeds have yielded the usual relics, An engraving of a clay pipe, found upon Levi Taylor's farm, is reproduced here from the Archæological Report for 1897-8, page 19. Some carbonized corncobs have been found among the remains, and cornhills were visible when the land was first put under cultivation. An aggregate of more than a dozen iron tomahawks have, at various times, been found by Mr. Hutchinson in his field.

A bonepit was discovered in the year 1879 on lot 9 (Levi Taylor's) near the boundary line of Mr. Hutchinson's farm. It measured about twelve feet in diameter, and the deposit of human bones went to a depth of about six feet below the level of the surrounding ground. Deducting two feet for the vacancy at the top of the pit, caused by sinkage, leaves the thickness of the deposit at about four feet. The bonepit has been filled in and is now ploughed over. A short account

of it appeared, at the time it was found, in the *Orillia Packet* of September 5, 1879, and this was reprinted (though the source was not indicated) in the *Toronto (Daily) Globe* of September 16, in the same year. Mr. Hutchinson confirmed, in the presence of the writer, on July 5th, 1899, the various particulars cited in this printed account. The pieces of copper had probably been sections from kettles obtained from French traders. The shape of one seen by myself was trapezoidal, its sides being about a foot long, and its parallel ends two and four inches respectively. Two or three skulls taken from the pit had round holes in them. We reproduce here the original description exactly as it appeared in the newspapers above mentioned:—

"While logging on lot 9, concession 5, Tay, Mr. John Hutchinson and Messrs. G. H. and Hugh Mills discovered a large grave, containing, they suppose, in the neighborhood of five hundred bodies. They opened the grave and obtained two tomahawks, bearing a French stamp: four pieces of copper, each resembling a sole of a boot, of different sizes, and wrapped in buckskin which is still fresh and strong; one clay tobacco pipe, and parts of two sea-shells, one in fair preservation. The bones are those of people much above the present ordinary stature. The searchers saw a few children's remains, but these were not in good preservation. A large tree was growing above, and had sent its roots down through, the grave. Mr. Hutchinson finds many pieces of Indian crockery in clearing up his farm (lot 10)."

Some camps that may be reckoned as part of this village occur on land of Wm. Taylor, the west half of lot 9, concession 5, abutting the farm of his son, Levi. His land extends over the hill already mentioned, and it was on the lower ground where these camps were found. On the higher ground, however, near his dwelling house, the point of a sword (ten inches long) was found in 1899 and from time to time iron tomahawks in considerable numbers. As many as seven were to be seen at one time lying around the house.

On the east half of lot 8, concession 5 (west side of Hogg River), there were formerly found a few pottery fragments, iron tomahawks and clay pipes when the land was cleared.

The scattered village that we have just finished describing may have been the mission marked Kaotia on Ducreux's map, though this mission was more probably the group in the 3rd concession at lot 10; but so inexact is the map just mentioned that we can scarcely decide which place is meant. The Rev. A. E. Jones, of St. Mary's College, Montreal, has a wide acquaintance with the literature of the missions, and makes Kaotia identical with St. Anne's (*Orillia News-Letter*, June 29, 1899).

10. John Houghton's.

A site on lot 10, concession 3, at which two bonepits have been found, has attained to more than ordinary fame. So many persons have seen or heard of one or the other of the bonepits here, and mention it to enquirers, that it has become the most celebrated among the many interesting sites of the district—a fact that is perhaps also partly due to the great size of one of the pits. It has been stated to myself that the first pit was examined by the late Dr. Taché during his explorations of the remains in Huronia. Whether this statement be correct or not (which we have no means of knowing, because Taché's work is chiefly unpublished), one of the pits was certainly known at an early date. It was often described as Errington's, because that was the name of the first settler near it, though it was not located on his farm. It appears to have been since the time of Dr. Taché's alleged visit, however, that another large bonepit was discovered near the first, the discovery of the latter having taken place in 1878. It attracted some attention in the newspapers at the time, and one of the paragraphs (from the Oakville *Express*, Nov. 1, 1878), we give herewith:—

"A large pit or 'cave' has lately been discovered on (near) Mr. W. Errington's farm, near Wyebridge, in which to appearance were the remains of about two thousand persons, besides brass kettles, beads, pipes, and other Indian relics. It is supposed to be in the vicinity of an old Jesuit fort, St. Louis, where in 1649 there was a terrific struggle between the now almost extinct Hurons and the Iroquois."

The skulls in this second bonepit are said to have been arranged in rows. Among the articles found in it were a block of copper, some copper kettles and braids of human hair. I visited this famous site on July 7, 1899, and inspected the pit just described. It has a diameter of twenty feet and is situated on the southeast quarter of lot 10, the owner being John Houghton.

What was described to me as the body of a child was found in one of these pits (probably the first one discovered), wrapped in fur, and placed in a copper kettle, the oxide from which had protected the fleshy remains from decay. But this may have been only part of a child's body, as descriptions are sometimes unintentionally distorted even by eye-witnesses. It is not improbable that it was the specimen that ultimately found its way into Dr. Bawtree's collection, and is designated "Forearm and hand of a child from Sepulchral Pit."

There was a cornpatch at this site, a portion of which may still be observed in the woods near at hand. There was a trail from here to Victoria Harbor, and if there was another trail in summer leading in

a direct line to Ste. Marie, the only passable route would lie nearly where the fourth concession line is now located, and would cross at least three evergreen thickets.

It will be observed that the writer of the paragraph, quoted above, gives credence to the view that the site under consideration was that of the mission of St. Louis II.; and the late Rev. J. W. Annis, a Methodist minister, who devoted some attention to the Huron sites, held the same opinion. I am inclined, however, to regard this place as the one marked Kaotia on Ducreux's map. And as a village had to be moved for sanitary reasons about every ten years, the two adjacent sites (Nos. 11 and 12) would probably indicate the same village at different periods of its existence.

11. Whether the campfires of the site just described are situated near the bonepits, or whether the marks of habitation there are only those incidental to the cornpatch, is not yet clear. It is established beyond doubt, however, that many ashbeds of camps occur on the west half of lot 10, concession 3. Wm. Hanes, the tenant, has found many pottery fragments, pipes, stone axes, and iron tomahawks, the latter being numerous.

12. On the east half of lot 9, concession 3, there is a village site that shows some evidence of fortification. It is situated on the level top of a hill or spur of high ground, and was probably palisaded. Ashbeds are numerous, and there was a refuse heap or mound, in all of which the usual relics have been found. The lot is owned by J. D. Carscadden, Elliott's Corners, and occupied by the family of Sylvester Campbell, Midland.

13. A village site occurs on the east half of lot 91, concession 1, Cornelius McCarthy, an early settler in the district and the first person to settle upon this lot, being still the owner. Stone axes, iron tomahawks, tobacco pipes, pottery fragments and other relics have been found at this site, which was located at natural springs of water.

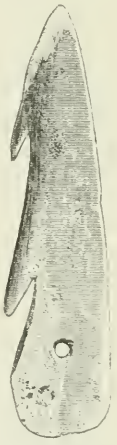
14. On lot 87 (east half), concession 1, a village site is met with; also a bonepit and ten or more graves or small bonepits. These were opened chiefly during the time of occupation of the late Anthony Latanville, who was the owner of the farm for many years. Prof. Henry Montgomery (now of Trinity University, Toronto) writes as follows of a relic found here: "The piece of large copper kettle, with beaver skin adhering to it, and which I donated to the University (of Toronto), was taken from an ossuary on Latanville's place." This relic is No. 335 of the University collection. The village site covers about three acres, and springs rise at it, uniting and flowing into the Wye

River. Iron tomahawks were numerous. A piece of lead fourteen pounds in weight was found; also bullets; and a neighbor, Thos. McDowell, once found a gun.

15. A village site occurs on the west half of lot 85, concession 1. Charles Elliott, who now occupies the farm on which the next site is located (No. 16), was formerly the owner here, and during his term of ownership pottery fragments, iron tomahawks, etc., were found. Refuse mounds, indicating prolonged habitation, occur at this site, which is near the stream belonging also to the next site, but on the opposite bank.

16. The village site numbered here is located upon the west half of lot 84, concession 1 (Chas. Elliott, owner). Pottery fragments, tobacco pipes, iron tomahawks and other relics have been found. The site extends across the Penetanguishene Road into Wm. McLellan's plot of ground, on which have also been found many iron tomahawks, pipes, etc. At this site, which is beside a stream, two empty caches or hiding pits occur on Mr. Elliott's land.

17. On the west half of lot 4, concession 3, occurs a site, but it does not appear to be so extensive as others on higher ground (George Simpson, owner). It is located beside a stream that runs into Hogg River at a short distance from it. They have found here various relics, including iron tomahawks.

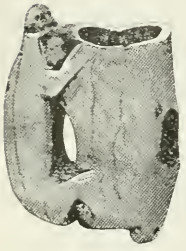


18. A village of considerable size existed on the southwest quarter of lot 77, concession 1. George Dawe is the present owner, but many remains were found in the time of Robert Gorman, the former occupant. Two refuse mounds were formerly to be seen, showing that the village had been a permanent one. Ashbeds occur over an area of about four acres, and they contained numbers of iron tomahawks, glass beads, pottery fragments, pipes, etc. A stream rises here and flows into Hogg River just beyond the Simpson site (No. 17).

19. Many relics have been picked up on the Bannister homestead, lot 76, concession 1. These included iron tomahawks, stone axes and pottery fragments, indicating the occurrence of Huron camps. But whether these were outlying habitations of the last mentioned village site (No. 18) or a distinct site altogether, I have not been able to decide. When the land was cleared cornhills were to be seen on the east part of this farm. In connection with the great abundance of

Huron corn patches, mentioned so frequently in these notes, I have observed that Indian corn at the present day matures with great rapidity on the fine sandy loam of this locality.

Various other sites occur in the immediate neighborhood of the Bannister farm, but just beyond the boundaries of Tay township. It is not our intention, therefore, to take notice of them here. But the occurrence of some camps where many interesting relics have been found may be mentioned in passing. These are on lot 76, concession 1, Tiny, the farm formerly occupied by the Bell family. A finely carved pipe, having a representation of what was probably intended for a bear, was among the relics found.



20. South-easterly from the mouth of Hogg River, and standing out by itself, is a tract of high ground on which some village sites are met with, undoubtedly Huron in their origin. One of these is on the west half of lot 11, concession 7, occupied by Joseph Belfry. On this farm, and near the site now under consideration, there is a piece of land where no large trees had grown in the forest that formerly covered the place —in fact, just such a bare patch as we found at No. 8. Some persons supposed that this also was an "Indian clearing," but in reality it was merely a gravelly patch, where the soil was unfavorable to the growth of large trees. The ashbeds here occupy a kind of shelf of land that slopes towards the north, and they extend westward across the seventh concession line, a short way into the farm of Sherman Belfry, east half of lot 11, concession 6. On both farms the occupants have found iron tomahawks, tobacco pipes, and the usual fragments of earthen pots Where the concession line crosses the site I observed many of these fragments in ashbeds, besides other evidences of Huron occupation. As higher ground lies along the south of the camps, and as their form is not compact but string-like, it is pretty evident that no palisading ever existed here. It may therefore be concluded that, although the village was inhabited during the time of French traders (as the tomahawks show), it was not occupied at the latest part of that period.

21. On the next farms southward, but separated from the last site by the slightly higher ground just mentioned, the remains of an important village have been found. It is situated on the north-east quarter of lot 10, concession 6 (Edward Crooks, owner), but also covers a portion of the south-east quarter of the same lot (Wilson Crooks, owner). Its position is on a high terrace with low ground along the south. The remains have been found chiefly at the fronts of these

two farms, near the dwelling-houses and farm buildings. Here they have found quantities of iron tomahawks, tobacco pipes, pottery fragments, etc.; and cornhills in abundance were to be seen before the ground had been cultivated long enough to obliterate them. These were especially visible when the first settler of this lot (William Hill) lived here. During his time the ashbeds were quite distinct. This site extends across the public road into the front part of the farm of Matthew Campbell (west half of lot 10, concession 7), where they have found the same kinds of relics; but the late George Mills, the original settler on this lot, found much more than has the present occupant. Although this site covered considerable ground, it is doubtful whether any palisading ever existed at it, not having been compact and lying adjacent to higher ground. Its position agrees closely with that of the mission of St. Louis as marked on Ducreux's map, which lays them down as they were about the year 1640, almost all having been shifted before the extermination in 1649.

22. Traces of a village have been found on the east half of lot 7, concession 7. James Hamilton, sr., was the first settler upon this farm, about eighteen years ago, and when clearing the land he found ashbeds, iron tomahawks and other relics.

23. Another exists on the east half of lot 5, concession 7. William Hopkins, the present tenant, and William Hanes, a former occupant, have both found the usual pottery and pipe fragments, iron tomahawks, flint spear-head, etc. The site is near a small ravine that drains northeastward to the Sturgeon River.

24. Across the concession line, on the west half of lot 5, concession 8, Arthur Loney, the owner, finds a few remains: but this site is not large in comparison with some others in the neighborhood.

25. Farther south on the same line, a site of considerable size occurs at the adjacent corners of lots 3 and 4, where four farms meet. When Robert Warden, the owner of the west half of lot 3, concession 8, dug the cellar for his dwelling house here, they found ashbeds of a surprising depth. Numerous relics were also found, including beads (native and European), iron knives and iron tomahawks, the latter in considerable numbers. Across the road in concession 7, near the boundary between the farms of John Morrison (lot 3, east half) and Robert Lochart (lot 4, east half) were some refuse mounds. And in the adjoining corner of Patrick Canavan's land (southwest quarter of lot 4, concession 8) a few relics have been picked up. It is estimated that the camps here covered about fifteen acres altogether, situated, as in so many other instances, upon an old lake terrace.

26. Another village occurs on the land of Andrew Brown, west half of lot 4, concession 7. A spring issues near this site and drains to the Sturgeon River. The occupants have found stone axes or "skinning stones" and other relics. Large numbers of French iron tomahawks have been found, especially during the time of the first settler, John Moad. It is related how the roof of his shanty was the receptacle for these relics, and was sometimes covered with them, fifty or more lying upon it at one time. Some scattered relics, similar to these, have been found on the opposite farm across the concession line.

27. When the east half of lot 3, concession 6, was cleared about thirty years ago, the first settler upon it—Matthew Campbell—found relics (including iron tomahawks) indicating the site of another village. A few were also found on the farm of his brother, the late John Campbell, across the road, but not in sufficient numbers to indicate any site. William Albert Campbell, a son of the first settler, now occupies lot 3 in question. There is lower ground on the rear of the farm where water could be had, the drainage flowing toward Hogg river.

28. Following the same concession line southward, one finds the site of another village on the next farm, east half of lot 2, concession 6. The owner, Hector McLeod, found the camps named in the southwest part of his farm, and they were strewn with various relics, such as pottery fragments, pipes, iron tomahawks, etc. Thomas, his son, found a large European bead which he sent to the museum. It is a large coarse glass bead, with hues of red, white and blue in a scallop pattern. The water drainage at the place runs southward and then around to Hogg river, passing westward about lot 22 in Medonte. The site is not large in comparison with others.

29. On the west half of lot 1, concession 7 (John A. Swan, owner), is another. Traces of it were formerly quite distinct on the high ground behind the farm buildings, and many relics of the usual kinds were found at various times—stone axes, iron tomahawks, tobacco pipes (both clay and stone) and pottery fragments. Mr. Swan settled here in 1870, and in the earliest years of his term of occupation cornhills were distinctly visible west of the camps, but these hills have been obliterated by frequent ploughing. In connection with this site it should be mentioned that a large bonepit was discovered in the year 1869 on adjoining land across the townline, in the township of Medonte. It is not yet evident whether this bonepit was connected with this site or with another farther south, but it is not too far from this one to have belonged to it, being only about seventy rods distant from the townline in front of Mr. Swan's residence.

30. There is a site on the farm of James Russell, east half of lot 4, concession 5, and some relics of the usual kinds have been found at it, but it appears to have been small in comparison with others. There was a patch of cornhills near by, and probably used by the inhabitants of this site, on the farm of Wm. Russell, west half of lot 3, concession 6, though these cornhills have been chiefly obliterated by cultivation.

31. The remains of a Huron village, the inhabitants of which appear to have used the same position for several years, have been found upon the west half of lot 3, concession 5. The first settler on this farm, Robert Webb, came in 1865, and remained on it until about twelve years ago. As he was a close observer, besides having resided here so long, our information in regard to the site is fuller than in many other cases. A noteworthy feature was the finding of a *cache* or hiding-pit filled with corn. The grains were as black as charcoal, and the inference was that they had been charred or roasted. But their black color doubtless arose merely from their great age, 250 years or more being sufficient to carbonize any kind of seed. The discovery of the corn is confirmed by Hector McLeod, who observed it while ploughing. The amount was estimated at more than two bushels. In the field south of the site many cornhills were visible when they cleared the land. Beside the village a human skeleton was found buried. Among the relics found were tobacco pipes of various kinds, some with human faces, stone axes, iron tomahawks and knives, pieces of brass kettles in great numbers. Since Mr. Webb retired from the farm various persons have lived upon it either as owners or tenants Among these were Matthew Vasey and Wm. Widdes; the present owner is George Jones. During their respective terms of occupancy some relics were also found. John Ashley Bailie, who taught at Russell's schoolhouse in the neighborhood, frequently searched here for relics. He writes of the workmanship of the specimens as follows: "The pottery fragments were nearly all nicely carved; the carving, of course, being of a somewhat rude type. The pipes showed a great deal of skill upon the part of the makers; their bowls were wrought in a variety of forms. In some instances they took the form of the head of some animal or bird. One pipe stem, judging from its appearance, must have been formed by drilling a hole right through an ordinary stone. A pipe bowl, formed out of a common stone, about two inches and a half in diameter, had on either side of the bowl a head of some animal." Mr. Bailie picked up many little pieces of sheet metal, probably from brass kettles. He says these were to be found in all parts of the field. It would appear that when the kettles obtained from the French traders became useless from having holes in them, the

Hurons cut them up by some means into chips and used the pieces as arrowheads, knives, etc. At some other village sites of the later period of French occupation, the ground is also strewn with these metal chips. In order to examine its position, I visited this site on July 5th, 1899, and made a diagram of it. The usual fragments of pottery and clam shells were to be seen. The ashbeds were most numerous at the head of a small ravine, the abrupt descent to which is about 30 feet; and here the inhabitants found their supply of fresh water in springs Passing from this ravine, the ground rises gently through the field, which contains about 12 acres but is not all covered with ashbeds. There is nothing in its situation to lead one to believe this village had been palisaded. When the Hurons built a village for defence, it was usual to select a place where Nature assisted. But here, Nature furnishes no aid, rather the opposite. So it is not probable that palisades will be found. A trail has always existed here, leading past site No. 30.

32. On the east half of lot 1, concession 5, there is a site where the usual relics—pottery fragments, pipes, iron tomahawks, stone axes, etc.—have been found. Robert Hall, the owner, has lived here since 1873, and he has informed me that before the land was cultivated he could see the cornhills that were used by the Huron inhabitants of the village.

33. A small site occurs on the east half of lot 2, concession 3. This farm was formerly owned and cleared by John Tinney, who found, previous to 1876, various relics including iron tomahawks. Among subsequent owners was Michael Russell, and the present occupant is Hiram Jennett.

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34. Various remains, found beside the shore at a spot just west of Waubaushene, indicate the position of what was a favorite resort of the aborigines in considerable numbers. It appears to be situated upon lot 11, concession 10. An area of about ten acres is the extent of ground over which remains have been found. The patch of second growth trees here was believed to show where there had once been an Indian clearance, but, as in many other cases, it may be more correctly explained by the presence of gravelly soil. It was formerly a favorite resort for relic seekers, some of whom dug into Indian graves, of which some exist here. The graves, thus molested, were not communal but single burials. Some iron tomahawks and gun barrels have been found, the latter tending to show that the site was occupied in the eighteenth century by Algonquins. But whether it was a landing place of the Hurons in earlier times is not yet evident.

35. Farther west, at Tanner's Mill, (also known as Tannerville) more aboriginal remains have been found. It was at the shore here that the trail to the interior had its northerly end. And in the days of early settlement (in 1830, or soon after) this trail was widened into a Government road from Coldwater, and a blockhouse erected here. The place was a depot on the way to the early mines of the upper lakes. It had docks, and the early steamers of Georgian Bay made it a port for calls, the other port being Penetanguishene. Altogether, the port of Sturgeon Bay—the terminus of the Government portage—in the days before railways was a stirring place. But its glory has long since departed. Many legends cling around the old place, and stories of buried treasures. But the only articles ever found here, so far as can be learned with certainty, were a few Indian beads and fragments of human bones, besides some other kinds of Indian relics. These were found on the high ground just back from the shore. This place was always a frequent resort of Algonquins; but its origin was doubtless earlier, in Huron times, when the trail to the interior was in constant use. Ducreux's map places the mission of St. Jean (not St. Jean Baptiste) to the right of the outlet of Sturgeon River, and a short way inland. It will be seen by referring to our map that there is a tract of high ground here, an island during the time of the Great Nipissing Lake, and this tract is separated from the high ground of the interior by low swampy ground through which a stream flows toward Sturgeon River. St. Jean was a mission to the Ataronchronons, while the mission next south of it (according to the Ducreux map), viz., St. Joachim, was among the Arendaronons. A physical demarcation of some kind, between St. Jean and St. Joachim, is thus suggested, because the Huron "nations" were usually divided from each other by physical boundaries. It is possible, therefore, that St. Jean belonged to the isolated tract of high ground now under consideration, and was a site near Tannerville, if not the one itself at the place.

36. Rev. Father Chazelle, whose investigations in the Huron country in 1842 we have already mentioned, made a search on the east side of the Sturgeon River for the site of St. Ignace, where Brebeuf and Lallemant were put to death. It is evident that, in doing this, he was following Ducreux's map, which gives the position of the earlier and first St. Ignace, and that he had not become aware of the fact that a second St. Ignace had existed. He directed the French Canadians with him to run the canoe up Sturgeon River a mile and a half from the outlet. Near where they landed they found, in the woods, a village site, and at it some relics, such as conch-shells. Here were "blazes" or marks upon trees, made by Indians of comparatively

recent times, but which lent an antiquarian setting to the place. They found also, in graves, the bones of two persons, which tradition has erroneously regarded as those of Brebeuf and Lallemant, forgetful of the fact that their bones were found by the searching party from Ste. Marie in 1649, and taken to Quebec.

37. Passing to the high ground east of the Sturgeon River, one finds the most northerly site of the group on the land of Frank Joseph, the west half of lot 6, concession 10. Here, on a patch of ground, cultivated only during the past two seasons, they have found stone axes, an iron tomahawk, a tobacco pipe and some fragments of deer bones.

38. Some ashbeds of Huron camps are met with on the farm of Alex. Begg, the west half of lot 5, concession 10. They have found pottery shreds, pipes, stone axes and numbers of iron tomahawks. Southwest of this site, which is not large, there is a small huckleberry marsh; it is on the opposite side of the road, on lot 4, but near the site.

39. A site of moderate dimensions occurs on the northwest quarter of lot 4, concession 10,—the farm of James Stewart. On a patch of high ground, toward the centre of the farm, they have found pottery fragments, iron knives, iron tomahawks, etc. Similar relics have been found on the adjoining fifty-acre farm, or southwest quarter of the same lot 4, which is cultivated by Mr. Begg; and also a few on the east half, owned and occupied by Robert C. Stewart.

40. Across the road, on the east half of lot 4, concession 9, James Paden, the owner, has found iron tomahawks, pottery fragments, etc., in ashbeds and patches blackened by Huron camp-fires. These occur on the highest ground—a large knoll at the rear of his farm.

41. A similar small site occurs on the east half of lot 3, concession 9. In the extreme southeast corner, the usual relics have been found; and a part of this site extends into the adjoining land of Joseph Greatrix, where he has found the kinds of relics mentioned under the last site, besides stone axes. On its north side this village was near another huckleberry marsh.

42. Another site, distinct from the one last mentioned, is on the farm of Joseph Greatrix, the east half of lot 2, concession 9. Mr. Greatrix has lived on this farm for 25 years, and has frequently found, at the rear of it, the usual remains of camps and the same kinds of relics as occur at the other villages of this group.

It will be observed that the six preceding sites on the Rosemount Ridge are small, there being probably not more than a dozen camps at any of them; and there are no bonepits associated with them. But on this same high ridge, in Medonte township, about a mile south of the Tay townline, some bonepits have been found at larger villages. It is but natural to suppose that, as regards Feasts of the Dead and the formation of bonepits among the Rock Nation or Arendaronons, the small outlying villages of this group would be tributary or subordinate to the larger villages situated farther south in Medonte. The mission of St. Joachim was perhaps in this group of smaller villages.

43. At a little distance from the shore of Matchedash Bay, near Fesserton, many relics of the aborigines have been found. These were most frequently met with upon rising ground on the farm of George Bush, lot 5, concession 12, and also on lot 4. Villages situated like this, near the shores of the large lakes, mostly yield relics which have undoubtedly belonged to Algonquins of a period subsequent to the Hurons. But in the present instance, if the remains were those of Algonquins, they must have belonged to an early period—before the traders had supplied them with kettles for cooking purposes—as is amply testified by the fragments of primitive pots made from baked clay, so commonly found at Huron sites, and also found here. At the projection of land known as Bush's Point, some refuse mounds were formerly to be seen.

44. On the opposite shore of Matchedash Bay, at Rankin's Point, on lot 6, concession 13, similar remains have been found. Here, by the shore, were also found a few graves (single burials) in which the skeletons had been buried in a crouching position. One of the skeletons was decked with a large medal, glass beads, and other trinkets done up in cedar bark, and evidently belonged to a more recent period than the Hurons. The same skeleton had unusually large proportions, and the back of the skull was found fractured, whether from accident or otherwise.

45. In a list of the antiquities of Tay, one should not omit to mention the remains called "The Chimneys," situated on lot 5, concession 13, opposite Fesserton, or rather Bush's Point, on the east side of Matchedash Bay. Jas. Abbott is the present occupant of the farm. The remains are located upon what is known as "Chimney Point," where an area of about 40 acres had been originally cleared. They constitute all that is now left of the buildings occupied from 1778 till 1793 and later by Cowan, a fur trader. The writer's purpose in re-

ferring to them in this place is because they were formerly often spoken of as the ruins of a structure belonging to the early French period. Even yet, they are sometimes referred to as such, and it is desirable to give a few words of caution against this error. Governor Simcoe was the guest of Cowan at this place in 1793. (See Macdonell's Diary in Transactions of the Canad. Institute, Fourth Series, Vol. I). On a recent occasion when the writer visited this place, the foundation of the main building could be distinctly seen, (built of stone and lime), and there were three chimnies grouped around this trading house —one apparently at either end of the building, and another at some little distance away, representing probably the bakehouse. There were other buildings near at hand, of which the foundations could be traced when Mr. Abbott first went there.

46. On Bluff Point, near Port Severn, some pottery fragments, pipes, etc., have been observed. No other relics have been found that would indicate the exact period to which this site belonged, which was doubtless quite early as the coarse fragments of baked clay vessels go to prove.

INDIAN VILLAGE SITES IN THE COUNTIES OF OXFORD AND WATERLOO.

By W. J. Wintemberg.

During the past four or five years I have had the pleasure of visiting the following Indian village sites: seven in Blenheim township, one in the township of North Dumfries: one in Waterloo Township, two in Wilmot, and one in East Oxford.

Blenheim Township.

Village Site No. 1, is situated on the farm of James Laidlaw, south-east quarter of lot 11, concession 8, and is directly opposite the C.P.R. station at Wolverton. The land has been under cultivation for the last twenty years, and as it was diligently searched by local relic seekers every time it was ploughed, naturally, very few specimens of any value are to be found.

A few mementoes of the primeval forest, in the shape of huge pine stumps, are scattered on the field. Some of these are over four feet in diameter, and if the manner of computing the age of trees by means of the concentric rings of annual growth be reliable, they are of great age. Several of these stumps stand on the top of an ash-bed, and on one being pulled up about two years ago, a few pottery fragments were found beneath it. Evidently the trees grew after the abandonment of the village by its inhabitants. What appears to have influenced the aborigines in the selection of this as a suitable place for settlement, was the presence of a small rivulet, which flowed in a north-easterly direction.

Wild fruits and nut-bearing trees are abundant in the neighborhood of this village site. Among the fruits may be mentioned, choke-cherries, wild red, and black cherries, and wild plums. These all came in for a considerable share in the Indian's bill of fare. Leather-wood or moose-wood shrubs (*dirca palustris*) are also abundant in some of the maple woods. The bark of this shrub is very tough, and, according to Peter Kalm, an early traveller, the Indians made use of it for ropes and baskets.

Among the many interesting specimens I found on this site are two Huronian slate gorgets; one unfinished, and the other merely a flat, oval pebble with two perforations. I also found a very small clay pipe, the dimensions of which are: stem, 1 inch; bowl, height $1\frac{1}{4}$ inches, diameter at mouth, $\frac{5}{8}$ of an inch. This specimen was undoubtedly a toy and may have been made by a child, as the workmanship is very rude.

Articles of shell are common. Many of them are merely the valves of a species of *unio* and were, no doubt, used for smoothing the inside of clay vessels while they were in a plastic state. They may also have been used in tanning, as they would be found very serviceable in dressing the hide and removing hair and fur. The larger shells, requiring no further preparation to adapt them to such a use, may have been used as spoons. The edges of some specimens are much worn, and many of them, it is evident, have seen long service as scrapers. I have found shell-beads on this camp, which are made out of two kinds of ocean univalves. One of these is a species of *olivella* and is ground at the apex to admit a thread. The other species has a perforation at the mouth. They also perforated for beads the shells of one of our large fresh-water gasteropods, *melantho* (*paludina*) *decisa*. The bone beads found on this village site are of the usual cylindrical form and were sawed off from small bird and mammal bones. They are from one-half to two and sometimes three inches in length. A large number of beads that appear to have been made of human finger bones, sawed in two and perforated at the ends, were also found. The general assumption among local collectors is, that they were the bones of enemies killed in battle, and were worn as a badge of honor among the Indians. I was always rather doubtful of this, as I believed that they were the bones of some quadruped and later research has proved this to be a fact, but one unacquainted with the anatomical details of the human skeleton would readily suppose that they were the phalanges of the hand.

A bone that seems to have been used as a pipe was found on this site by a friend. It is either a metacarpal or metatarsal bone from some large mammal's foot, and has a large hole bored at the larger end and a smaller, without doubt, the stem-hole, at the other. Mr. Boyle, to whom I showed this specimen and the "finger-bone" beads above mentioned, thinks that they were used as bangles.

The hammer stones that have been found here are of the usual oval or rounded form pitted on the flat side. Albert Smart of Plattsville, found a specimen with a handle, which is pitted on the larger end on both the upper and lower surfaces. This was no doubt used as a nut-cracker. The late Newell Waugh, of Bright, found a similar specimen on village site No. 3. I found a specimen that is not pitted, but which appears to have come in contact with some hard substance like flint, for the indentures or pits are not rounded as in most of the specimens found, but are long and angular; perhaps it was used in flaking flint and other hard substances.

It is well known that ochre was used as a coloring matter for the face and hands by the aborigines. I discovered a small deposit of red

ochre on this site, which appears to have been contained in a pot, fragments of which I found with it. It is of a dull, reddish hue when dry, but when wet it assumes a bright red color. It was no doubt applied to the body with grease, for thus it would always retain its bright color.

The finding of articles of native copper on this village site proves that the primitive inhabitants of this district had some intercourse with the Indian tribes of Lake Superior, where the copper was originally procured, for it is well known that no copper of a malleable nature exists within the boundaries of the Neutral or Attiwendaronk territory. The objects were awls. The person who found one of them described it as being over five inches in length, about as thick as an ordinary lead pencil, with a sharp point. However, it is to be regretted, all trace of these specimens has been lost, and none of the same material has since been found.

When the ground in this field was first broken by the plough, a large boulder, possessing a very peculiar property, was found. When it was struck with a stone it emitted a clear, bell-like sound. This stone, I understand, was removed to Toronto by an archæologist of that city. Another large boulder bearing pictographs was also found. This boulder, the owner of the farm asserts is still, on the place, and is in the centre of a large pile of stones to the west of the camp.

Robert Laidlaw, father of the present owner, once ploughed up the skeleton of an Indian, the bones of which are said to be of gigantic size. Mr. Laidlaw was overcome with superstitious dread and covered the skeleton with soil, and while he lived, that part of the field was not touched by the plough again.

When the railway was being built, and while making a deep cut through a hill on the east side of the Wolverton station, the Italian laborers are said to have unearthed two burial pots provided with lids, each containing the skeleton of a child. The Italians, however, not having archæological tastes, immediately began breaking the pots to pieces crying, "Gold! Gold!" much to the chagrin of the foreman in charge. Last summer I became acquainted with a person who had helped to build this railway. I asked him regarding the matter and he said that there was only one pot found, and it was a large stoneware milk-pot of white manufacture, containing the bones of a white child. He also informed me that the foreman in charge had the pot and its contents reinterred where it would not be disturbed again. In a conversation with John F. Rathburn, of Drumbo, I was informed by him that the above statement was false, and that the bones were really those of Indians, as well as the pots; and he also told me that Mr. Fox, an old pioneer residing at Drumbo, would tell me the same. Further

information bearing on this matter was furnished by George Johnston, sr., who lives on lot 9, about a quarter of a mile from where these pots were found. He says that some years ago he pulled a large stump which stood in one of his fields, and found beneath it a pot containing the remains of an infant. This pot was also provided with a lid.

Next in order of importance comes Burgess' Lake camp, which I will in the future refer to as Village Site No. 2. Burgess' Lake is a pretty sheet of water lying to the south of Drumbo, and the country surrounding it, apparently, was a favorite rendezvous of the red men in primeval times. The first time I visited this place was on the 17th of October, 1897, on the invitation of John F. Rathburn, who lives on the south half of lot 13, 6th concession. We examined the nature of a deposit of black soil which is situated in a field near the lake. Mr. Rathburn had dug some test holes a few days previous to my visit, one in the centre showing that the black soil extended to a depth of three feet. A number of small stones were thrown out while making the excavation, all of which showed unmistakeable signs of having been subjected to considerable heat. Especially was this found to be the case with a piece of limestone which had been calcined. Strange to say, no relics of human origin were found, not even a pot-sherd.

In the month of August, 1898, I found three other beds or deposits similar to the one above referred to, but not one yielded a single specimen of aboriginal handiwork. Mr. Rathburn finds pottery fragments and other relics in abundance on his farm, but not in ash-beds, as is usually the case. The pottery fragments are mixed with the soil which does not contain the slightest trace of ashes.

Wild fruits are abundant. Among those I noticed were the wild black cherries, red cherries and raspberries. There are also a number of nut-bearing trees, on the east side of the lake. The lake is said to contain fish. The presence of all this would necessarily cause the Indians to settle around the shore of the lake.

The pottery found on this place is entirely different in material and style of ornamentation from any I have yet found. Although the distance between this place and Village Site No. 1 is only about four miles, there is a marked difference in the pottery. That from Burgess' Lake is of coarse material with ornamentation consisting of rows of indentures made by some pointed instrument, while that from Wolverton, although not of elegant pattern, is of better material and finish. The interior surface of some specimens appear as if it had been decorated by having a piece of netting pressed against it while the pot was yet in a plastic state. Mr. Rathburn found fragments of

pottery which, in addition to the usual pattern, consisting of oblique lines, were ornamented in a very peculiar manner. The aboriginal potter used what appears to have been a piece of wood $\frac{3}{8}$ of an inch wide and $\frac{1}{8}$ of an inch thick. With this implement, holes were made around the inside of the pot, about $\frac{1}{2}$ inch apart, and 1 inch below the rim, and the wood being pressed into the clay formed a small, oval protuberance on the outside of the vessel. I have a small fragment of pottery from this place, which is also ornamented in this manner, except that the holes are round and the knobs or bulbs are on the inside surface.

Mr. Rathburn has a very choice collection of celts, adzes, chisels, hammer-stones, grooved axes, pottery fragments, and a large number of arrow heads. Most of these specimens he found on this farm. It affords me much pleasure to say that he is taking an intelligent interest in local archæology.

About four miles south of Mr. Rathburn's place, there is a field where a battle is supposed to have been fought. The early settlers, Mr. Rathburn says, found numerous flint arrow heads deeply imbedded in the trunks of trees, and even at the present day large numbers of flint heads are annually turned up by the plough. I cannot believe, however, that an arrow impelled by a bow, could have sufficient penetrative force to penetrate a tree whose wood was of any ordinary hardness.*

Village Site No. 3, which was first discovered and made known to me by the late Newell Waugh, is on the farm of John C. Rudell, north half of lot 23, 10th concession. This site is only a short distance from a small creek, which flows in a south-easterly direction.

I found a number of relics on this site; most of them are, however, not of much importance. The last time I visited the place, I found a very interesting specimen, the Thunder Bird pipe described and figured in Mr. Boyle's report for 1897-1898.

On one side it has the representation of the Thunder Bird, a mythical being to which was attributed the phenomenon implied by its name. The drawing represents a bird with a human head, and above the head are two symbols of lightning. The simplest delineation of lightning among savage folk would naturally be by zig-zag strokes. They are used by the Pueblo and Tusayan Indians to represent lightning, and were used by a more enlightened people, the ancient Assyrians. It is a matter of conjecture what the upright line and the three

* Since this was written, Burgess Lake has been drained, until it is almost dry, and in the bottom, rows of stakes have been found. Mr. Rathburn writes that stakes are also found in the bog (the old lake bottom) recently forming the shore.—D. B.

crossbars on the breast signify. They may represent the vital organs; perhaps the heart and lungs, and, symbolically, the life of the individual. The zig-zag mark at the right of the bird's tail, no doubt represents another lightning stroke, or a snake, or, perhaps, both, for among some savage tribes the lightning and the snake were regarded as identical; *i. e.*, the lightning flash, owing to its resemblance to the sharp, sudden, zig-zag movements of the snake, was often called a fiery serpent. Thus, some tribes of our Canadian Indians call the lightning a fiery serpent, and believe that the thunder is its hissing. Curiously enough, the ancient Greeks, with all their philosophy and learning, held the same view—the flashes of lightning having been regarded by them as the fiery serpent of Zeus, the god of the air.

Early in the spring of 1899, I again visited Village Site, No. 3. I found a bone bead resembling fig. 207 in Boyle's "Notes on Primitive Man in Ontario." This specimen has three collars on each end and two in the centre. I again visited this site in the month of May and also in August, but I did not find anything of very much importance.

I discovered another village site on the farm of Mrs. Geo. Hunter, about one-fourth of a mile from Village Site No. 4. This site does not appear to have been occupied for any great length of time, as I have found very few relics. After a hurried survey of the ground covered by this site, and finding a "goose-beak" scraper and bead, I dug into the principal ash-bed with a spade, and found a number of marked pottery fragments, and a very fine bone awl.

Village Site, No 4, is situated on the farms of Mrs. Geo. Hunter and Jas. Hall, south half of lots 13 and 14, 10th concession. I found a number of specimens on this site. Mr. Hall has found celts, arrow heads, and other specimens.

Village Site, No. 5, is situated on the farm of Albert Kaufman, north part of lot 8, 12th concession, Mr. Kaufman's son found a number of specimens on this site, including pottery fragments, arrow points and part of a ceremonial gorget, with one perforation.

There is a site (No. 6) on the farm of Benjamin Schlichter, north-east part of lot 4, 13th concession. The land has been cultivated for about four years. I have never visited this place, but a friend found a number of specimens. One of the pottery fragments found here is of very coarse material, and the style of ornamentation on it is similar to that on the pottery found at Burgess' Lake.

There is also an isolated camp on the north half of lot 10, 10th, concession. I visited this place last summer and noticed the usual stones, cracked by fire, but found no relics. Henry Baxter the former owner, found a large number of arrow heads, a few very fine flint drills, and two circular ceremonial objects with a hole in the centre. The latter specimens were, unfortunately, lost. About one hundred feet from this camp, Mr. Baxter and his brother, while removing some sand from the side of a hill, nearly ten years ago, unearthed the skeleton of an Indian. They reburied the remains in a fence corner not far from where they were originally found.

North Dumfries Township.

Up to the present, I have found only one village in this township, and this is on the farm of Geo. Elliott, north part of lot 42, about 1½ miles north-east of Roseville. The land was cleared over fifty years ago. When it was first ploughed, Mr. Thomson, the original owner, uncovered a number of whole clay pots which were kicked to pieces. Mr. Elliott says that it was a common occurrence to see Thomson's sons coming to school with their vest pockets full of bone awls, which were disposed of in boyish barter.

Mr. Elliott has found some very fine relics on his farm. One skull is all that ever was found in so far as regards human remains, and this was put on the top of a stump fence where it remained until decayed. A mortar was also found, but all traces of it have been lost.

On this site there are three large ashbeds—one extending north and south along a ridge about half-way across the field, the other two lie to the east of this

The farm, when first cleared, was covered with a dense growth of pine. The stumps of some of these trees, Mr. Elliott avers, were over four feet in diameter. To the west of the village site, a marsh and small stream formerly existed, and here a number of beavers were wont to erect their domiciles "in the days gone by."

Mr. Elliott recently found a small meteorite on his farm, which had evidently been found and carried there by the aborigines. The fractured edge of this specimen looks like the edge of broken cast iron. It is about the size of a fist and is covered with a brownish oxide.

Waterloo Township.

About two miles from the above site, there is another, the most extensive one I have yet visited for it covers several large fields. It is on the farm of John Welsch, who lives either on lot 8 or 9 in the German Company's tract, which comprises the south-eastern part of the township. Not having very much time at my disposal when I visited this place, I had to content myself with a very hasty examination.

Herbert Trussler, a local collector, has been making the most extensive finds on this site. Messrs. L. J. Niebel and H. Z. Smith, of New Hamburg, have also done some collecting.

Wilmot Township.

The county surrounding the village of Baden, formed an ideal home for the Indian. The range of hills that stretches about one mile across the country, form a conspicuous object for many miles around. According to some of the older settlers, the surveyors who laid out the route of the Grand Trunk through this part of the country in 1853, made the calculation that the height of these hills was 960 feet above the level of the lake at Hamilton, and is the highest point between Sarnia and Niagara. Signal fires built on these hills could be seen for miles across the country. To the north of these hills there is a small lake about half a mile in breadth, to the south-east is another of nearly the same size.

On the north-east bank of the former, there is a small camp site, which appears to have been a temporary camp. The ashbed is on the side of a hill which has a slope of about 40 degrees. This would not be a suitable place to erect a wigwam, and the aborigines undoubtedly built it on the top of the hill where it was level, and being near the edge of the hill they shoved the ashes and other refuse over its side, thus accounting for their presence.

About half a mile south-east of the largest hill, there is another village site, on lot 10, Snyder's road concession. My first visit to this place was in 1897. On a subsequent visit I found a hammer-stone, having an indenture or pit on one side and two on the other, something unusual in this class of primitive implements, The pits on this specimen were not formed by constant abrasion resulting from cracking nuts or a similar operation, but appear to have been formed in some grinding process as they are smooth, and round. Besides it is formed of sandstone, a material totally unfit, owing to its soft and friable nature, for use as a hammer-stone. The edges also do not bear characteristic marks from hammering as do most specimens of this class. It is therefore a matter of conjecture for what purpose this specimen was used.

I again visited this locality in August, 1897, accompanied by a friend, and we discovered a large number of pottery fragments and a bone awl over eight inches in length. The ashes on this site are in a solid bed and the pottery sherds are mixed in with it and the soil. Some places you may dig to a depth of three feet before you come to the ashes.

On another day, accompanied by a young friend, I again visited the place and found a number of specimens. About four yards from the principal ashbed is a small rivulet running in a southerly direction. In hopes of finding evidences of settlement further down the stream we followed its course southward. While I was examining the character of the soil in an opening in the woods on the banks of the stream, a large glacial boulder attracted my young friend's attention and he examined it. He removed the moss and lichens which covered it and presently startled me with the information that he had discovered an Indian mortar. On reaching the boulder I found that it had been used for such a purpose, but not for any great length of time, as the hollow was only about three-fourths of an inch in depth. The boulder is about three by four feet and about three feet in height. Material, a close-grained and compact granite. It is partly buried, only about one foot (on the side where the mortar is) protruding from the ground. We followed the stream further, until it emerged into a clearing. Here we succeeded in finding the traces of another camp site.

It is said that in the early days, when Wilmot township was first settled, an Indian trail leading from the Georgian Bay to the vicinity of Baden was still to be seen. According to some of the old Amish* settlers, a tannery formerly stood on the west hill, and here the Indians coming along the trail would sell their furs.

A number of years ago the remains of an Indian were unearthed near the village of Agatha, about four miles from Baden. The grave had evidently been covered with birch bark or a birch bark canoe, as remnants of this material were found on top of it.

An isolated camp site was discovered by L. J. Niebel near the village of New Hamburg. He found a pipe-bowl, of which No. 16460 in the Ontario Archæological Museum's catalogue is a cast, on this site. In company with the above-named gentleman I examined this camp site in 1896, but we did not find anything.

East Oxford Township.

There is a village site on the farm of William P. Hart, lot 17, concession 3. After nearly half a century's cultivation, the evidences of aboriginal occupation are still visible in the burnt stones and black spots in the fields. The largest of these spots is on a high, sandy knoll, and is about forty feet in width.

Some years ago a few human remains, comprising a humerus, a frontal bone and a portion of the upper jaw were found while digging a ditch through a swamp on Mr. Hart's place.

*The name of a religious sect resembling the Mennonites in belief. The people are of German origin.—D. B.

Mr. Hart found a large number of arrow heads, celts, pestles, scrapers, a few ceremonial objects, and a small mortar about six by seven inches, with hollows, nearly an inch and one-fourth in depth, on both sides. The stone is about three inches thick. In one of the fields there is a large boulder, with a deep hollow on its upper surface, which was undoubtedly used as a mortar. A large block of freestone, which I examined, showed unmistakeable signs of having been used as a rubbing stone.

A few years ago an unfinished bird amulet was found on this site. It is now in the possession of R. W. Bass, of Oxford Centre. The basal holes are not yet bored in this specimen, neither has it been polished. It was not pecked into shape, but seems to have been reduced to its present form by sawing and scraping.

Mr. Hart has, so far, found only fragments of one clay vessel, and these were found a considerable distance from any of the ashbeds.

This village site is convenient to the old Indian trail (which is now the old stage road) from Lake Ontario to Detroit River.

THE WYANDOTS.

By William E. Connelly.

[Everything relating to the Hurons and their kith—the Tobacco Nation, Petuns, or Tionnontates—who occupied the country of the Blue Hills, most of which is now comprised in the township of Nottawasaga, should prove interesting to Canadian readers, and especially so to those of Ontario. As allies of the Hurons proper they shared a similar fate at the hands of the Iroquois, in the middle of the seventeenth century, and after many wanderings and vicissitudes at last found a resting-place in the territory (now state) of Nebraska.

According to the traditions they still entertain, they twice occupied the ground on which Toronto is built, but on both occasions were driven off by the Iroquois. Ossuary burial within a few miles of this city attests the statement respecting their abode here for a time, and we have the authority of Mr. Connelley, who has, for a great many years, made a special study of the Wyandots (*Ouendats*) as the descendants of the Tionnontates are now called, that they regarded the locality with much favor, and speak of it to this day as "The Place of Plenty"—Toh-rŭhn'-toh.

No man living is better qualified to express himself authoritatively on matters relating to the Wyandots than is Mr. Connelley, and the ethnological student of Ontario has great reason to thank him for his courtesy in contributing to this report. His exposition of the Wyandot clan system is deserving of special mention, not only because it relates to the people in question, but because the subject is one possessed of more than average interest to students of early man in every part of the world.—D. B.]

Migration Legends.

That the Wyandots are related to the people called Hurons by the French there is no doubt; but they are descended principally from the

Tionnontates, * and it will probably develop that the Tobacco Nation was the oldest branch of the Iroquoian family. While many fragments of the Huron tribes fled from the fury of the Iroquois the Tionnontates retained the tribal organization which we afterwards find in the Wyandot tribe. The Wyandot language is a modernized Tionnontate language, and the myths of the Wyandots are the old myths of the Tobacco Nation but slightly affected by other Huron intercourse after the destruction wrought by the Iroquois in 1649-50.

After having studied the Wyandot language and the Wyandot myths, traditions, and legends for almost twenty years I am of the opinion that the Tionnontates were more Iroquois than Huron-Iroquois, and that while they were in alliance with the Hurons they were more recently and closely related to the Senecas by blood, and that they were older as a tribal organization than either the Senecas or the Hurons. In my opinion their folk-lore and traditions confirm this view. I believe a critical and comparative analysis of the two languages will still further strengthen this position.

Both the myths and the traditions of the Wyandots say they were created in the region between James Bay and the coast of Labrador All their traditions describe their ancient home as north of the mouth of the River St. Lawrence. Taking their legends as a guide on this subject the most probable location of the place where the ancient Tionnontates assumed a tribal form is in Labrador, on the head waters of the Hamilton River; but possibly a little more to the west, in the district of Ungava, If not at this place, it was certainly between the point here indicated and Lake St John on the south. It is probable that at this period of their existence they ranged to the coast of Labrador and to Hudson's Bay and were familiar with the country between these points. They claim to have known the Eskimo. Their migrations led them along the shores of Hudson Bay, and from here they turned south and came to the region of the Great Lakes. After a sojourn here of some time—possibly a long time—they finally settled on the north bank of the St. Lawrence. They believe that in all these migrations they were accompanied by the Delawares. On the St. Lawrence they say they had the land on the north bank from the Ottawa River to a large river to the east, probably the Manicouagan River. The Delawares had the remainder of the north bank of the St. Lawrence to its mouth.

This country the ancient Tionnontates called Kööyh'-nohn'-toh't-tīh'-āh-hä, which means "The rivers rushing by," or "The country of rushing waters."

* On reading this to an intelligent Cayuga he readily recognized the name, which he pronounced Tyon-on-tah'-ti-gah, or Dyon-on-dah'-ti-gah.—D. B.

The Wyandots assert that while they resided there they numbered many thousands, and that they were the dominant power in all that country. On the south side of the River St. Lawrence lived at this time the Senecas,* so the Wyandot traditions relate. Which people came into this country first they do not say. The Senecas claimed the island upon which Montreal is now built, and the Wyandots admitted their right to it. The Senecas and Wyandots have always claimed a cousin relation with each other. They say they have been neighbors from time immemorial, but often at war with each other. Their languages are almost the same, each being the dialect of an older mother-tongue; they are nearly alike as are the Seneca and Mohawk dialects. That mixed people of the Mengwe stock made up from all the tribes of the Iroquois, but principally from that of the Seneca, and called Mingoes, have long lived beside the Wyandots; their reservations adjoinin the Indian Territory. Until within the last five years the Senecas predominated among this people on the Seneca (Cowskin River) Reservation and the Wyandots could speak the Seneca language as well as they could their own, and so could the Senecas that of the Wyandots. Recently the Cayugas from the eastern reservations have overrun the Seneca country, and within the last two years the Cayuga has become the most common language.

That part of the Wyandot tradition relating to the Delawares holding them company I regard as having some foundation in fact. The Wyandots relate a myth describing the origin of the Delawares. While this myth cannot be true, it indicates an association of the peoples at a very ancient date. In the Delaware sociology the Turtle Clan is regarded as the most ancient and most honorable. The Delawares make some claim to being the oldest of Algonkin tribes. It is possible that they obtained their ideas of the importance of the Turtle from the Iroquoian peoples.

The Wyandot traditions recite that when they lived on the St. Lawrence River the Ottawas lived on the Ottawa River, in Canada, and that they were neighbors and friends. Indeed, one account says they were allies in a war against the Senecas.

When the Tionnontates came to the St. Lawrence River, and how long they remained there cannot now be determined, even if it is finally established that their migration legends are founded upon probability. The Wyandot traditions say that they were with the Senecas at the Indian meeting to receive Cartier at Hochelaga in 1535, and that Hochelaga was one of the towns of the Senecas.

* A name formerly often used for the Iroquois. Similarly, Mohawk was sometimes employed to designate all the Iroquois or Five Nations.—D. B.

Writers have held the opinion that the Tionnontates migrated from the St. Lawrence directly to the point where they were found by the French Jesuits. Whatever the facts may prove to be, their traditions tell a different story. They claim to have become involved in a deadly war with the Senecas while both tribes yet lived on the St. Lawrence, because of murders committed by a Wyandot at the instigation of a Seneca woman.

Hale makes Peter D. Clarke say that the Wyandots fled to the northward to escape the consequences of this war with the Senecas. That they fled for this purpose is true, as they admit, but neither Clarke nor Wyandot tradition says that they fled to the northwest. The route of this retreat lay up the St. Lawrence, which they crossed, continuing westward along the south shore of Lake Ontario. They held this course until they arrived at the Falls of Niagara, where they settled and remained for some years. They called this point in their wanderings Kyōōh′-däh′-měh′-ēhn-dĕh, which is only their name for water-falls, and means "The stream falls into itself," or "The stream tumbles down to its new level from the rock above." Louisville, Kentucky, or its site, was so-called by them from the Falls of the Ohio.

Tionnontates removed from the Falls of Niagara to the site now occupied by Toronto, in the Province of Ontario, Canada. Their removal from the Falls of Niagara was in consequence of the arrival of the Iroquois on the Hudson and Mohawk Rivers. As the Iroquois continued to arrive in ever-increasing numbers, and to spread over the country now known as Western New York, the Tionnontates remained but a short time at Toronto. Their stay at this point was probably about five years, and certainly did not exceed ten years. They left Toronto with much regret, and if their traditions can be relied on, a band of them returned to their old home here many years afterwards, but did not remain long for fear of the Senecas. They seem to have been attached to no other point occupied by them in their migrations so deeply as they were to Toronto.

The Wyandots, or their progenitors, the Tionnontates, called their settlement at Toronto, Tōh-roohn′-tōh′^{nk}. This is their word for "plenty." It is now pronounced Tōh-rŭhn-tōh. The present name of the city is only the modern pronunciation of the Wyandots of their word for "plenty," and the modern pronunciation of their ancient name for their beloved settlement. As applied to the city, or the country included in their settlements, it should be interpreted "the land of plenty," or "the place of plenty," or "the place where food is plenty." Indeed, Governor Walker slightly modified the name when he wrote it, and made it Cau-ron-tool. By the power given the letter *c* by the Wyandots, this name is Kyōōh-rōhn′-tōōh^{l}. This is a prepo-

sitional form of the word Tōh-rŏŏhn'-tōh'nk, and means "the land where food is plenty," and has therefore reference to the abundance of game and fish they enjoyed during their residence at this point. And in relating this tradition to me they always dwelt with pleasure on their residence in the "land of plenty," as they oftenest rendered the name for Toronto. * No other place in which they lived after their great migration seems to have so taken hold of their affections. And this is proved, also, by a band of them trying again to take up a residence in the vicinity after their return from their wanderings about the northern lakes.

When the Tionnontates migrated north from Toronto they seized upon a tract of country to the south and west of the Hurons and adjoining the country of that people. A war with the Hurons was the result. This war lasted for some time, and as the Tionnontates were able to maintain themselves in their position so forcibly taken, it resulted in a close alliance between the two nations, and the Tinnontates became a nation of the Huron confederacy. The old Wyandots told me this confederacy was formed to resist the arrogance and the increasing power of the Iroquois.

The Clan System of the Wyandots. [a]

The animals of Wyandot mythology had two very different orders of descendants. The one consisted of degenerate mammals, birds, or reptiles having the appearance or nature of the ancient animal gods but devoid of their supernatural powers. The other descendants are the Wyandots themselves. This is true, of course, only of those ancient monsters or animal-gods selected by the Wyandots as the progenitors of their subdivisions known to us as clans or gentes.

Progress in the development of the Wyandot mind was slow and unsatisfactory, but the belief that the people were actually descended from the animals was gradually giving place to the conception that they were the creation of the Good One of the twins born of the woman who fell down from heaven, † and this belief once firmly seated would, in time, have overthrown entirely the older faith in the ancestry of the totemic animal-gods. But it had not made that degree of progress when the stronger faiths and beliefs of the white man forever arrested development in the mythology of the Tionnon-

* Sagard, referring to the word *Touronton*, which, in the narrative of De la Roche Daillon, seems to mean *oil*, says (p. 893). "The copyist of the Father's letter mistook, according to my opinion, the Huron word Otoronton, which he gives as meaning *oil*. Properly speaking it signifies *plenty*, or *Oh! how much*."—D.B.

† See Ontario Archæological Report for 1898, p. 58.—D. B.

tates. The animal myth, while losing ground, stood side by side with the higher conception, Tsēh′-sĕh-howh′-hooh^{ngk}, and the mind of the Tionnontates had not made sufficient advancement to enable it to distinguish this difference or perceive this incongruity. Thus while the Tionnontate believed he was the work of Tsēh′-sĕh-howh′-hooh^{ngk}, he also believed that he was the descendant of the animal gods, who held the Great Council to devise a home and resting place for the woman who fell from heaven.

Matthias Splitlog reasoned as follows upon this matter:[1]

"The animals of the present time are the descendants—degenerate descendants—of these same animals that made the Great Island for the home of the woman who fell down from heaven. They are diminutive in size as well as devoid of the divine attributes possessed by their ancestors, though all animals were supposed by us to be endowed with reason, and to be able to exercise it upon all occasions, and our faith also endowed them all with an immortality as lasting as we imagined our own to be.

"These ancient first animals are the heads of their own species to this day, *i.e.*, the Great Turtle who bears up the earth is the ancestor of all the turtles in the world of the same species: this rule applies to every species of animal living at this time. The animals are subject to their ancestors in a certain degree yet, and it is supposed that grievances against either other animals or man may be complained of to these animal-ancestors who will regard the complaint, and perhaps inflict some form of punishment. On this account the bones of certain animals supposed to be peculiarly sensitive to insult were treated with consideration by the Tionnontates and their descendants, the Wyandots."

"The gens is an organized body of consanguineal kindred in the female line," is Powell's excellent definition of the subdivisions of the Wyandot tribe, but as I have selected for my task the making of a record of what the Wyandots say of themselves, and as they always used the word *clan* when speaking of these subdivisions, although they say the Wyandot word denoting this subdivision should be rendered *tribe*, I have followed the Wyandots, and used the word *clan* to denote this subdivision of the tribe.

All my investigations among the Wyandots tend to confirm the view that in the ancient times when the Tionnontates first assumed a distinct tribal organization they called themselves a Turtle People.[2] Particularly does their mythology indicate that this was true of the ancient Wyandots. The Big Turtle made and yet bears up the Great Island, and his selection as chief officer of the Great Council called to devise the Great Island indicates that he was the most important per-

sonage among the ancient monsters who ruled the world before the coming of the woman. The Little Turtle was a potent factor in this first Great Council, and she varnished the thin coating of earth about the edges of the shell of the Big Turtle when he made from it the Great Island. Then she was made the Keeper of the Heavens and the creator of the sun, moon, and many of the stars. The Mud Turtle had a hand in the creation, for she dug the hole through the great island for the use of the sun in going back to the east to rise each new day. She turned aside from this work long enough to create in the bowels of the earth the most beautiful land the Wyandot imagination could picture. This land is the future home of the Wyandots, and until the arrival of the woman, who fell down from heaven, who is to go and rule there when time is no more in this world, the Mud Turtle is the ruler of this Wyandot elysium, the home of the soul, the land of the little people.

The Turtle clans were always considered the most ancient and most honorable of the tribal subdivisions, and the order of precedence and encampment was according to the "shell of the Big Turtle." The turtle idea was interwoven with the whole social and political fabric of ancient Tionnontate institutions.

That the multiplicity of these tribal subdivisions was the work of a long development is proven, I believe, by the remembrance to this day of the myths accounting for the origin of the Hawk and Snake clans. If there is any merit in my conjectures I write the first subdivisions of the tribe as follows:—1, Big Turtle; 2, Little Turtle; 3, Mud Turtle. Of the other clans I feel positive that they were added later, in the following order, as the tribe increased in numbers:[3]—4, Wolf; 5, Bear; 6, Beaver; 7, Deer; 8, Porcupine: 9, Hawk.

The next addition to the number of clans was made by a division of the Mud Turtle clan, the seceding party or band taking the name of Prairie Turtle, or Highland Turtle, or Box Turtle.[4]

And after this the Big Turtle clan was divided, the seceding party taking the name of Striped Turtle.[5]

The last addition to the number of clans was made by a division of the Deer clan, the seceding party taking the name of Snake.[6]

The Wyandot name for the clans is Häh-tīh′-täh-räh′-yĕh,[7] or Hōh-tēh-dīh-rēh-shrōh^{n}.'nyōh^{ny} [8]. In designating a single clan the same term is used, and, whether one or more clans, is determined by the context. The old Wyandots always used the word in the sense of *tribe* or tribes.

Major Powell says in his "Wyandot Government" that "up to the time that the tribe left Ohio, eleven gentes were recognized, as follows: 1, Deer; 2, Bear; 3, Highland Turtle (striped); 4, Highland

Turtle (black); 5, Mud Turtle; 6, Smooth Large Turtle; 7, Hawk; 8, Beaver; 9, Wolf; 10, Sea Snake; 11, Porcupine."

As to the names of the Wyandot clans, Major Powell's informant was certainly in error.

Peter D. Clarke, in his "Traditional History of the Wyandots," says only ten clans existed in the tribe; but he enumerates nine only, and two of these he does not distinguish. His list is as follows:

1, Big Turtle; 2 and 3, two different kinds of smaller Turtle; 4, Deer; 5, Bear; 6, Wolf; 7, Porcupine; 8, Hawk; 9, Big Snake; 10, some clan that became extinct at a remote period.

Clarke always meant well. Some things he did fairly well, but his judgment was often at fault as to what was most deserving of preservation in the Wyandot traditions. And this idea of ten tribes was of missionary origin, to conform to the absurd theory long held, that the Indians were descended from the ten lost tribes of Israel. Even the scholarly Governor Walker did not refute this error, although he possessed the information that would have enabled him to do so. His list of the Wyandot clans is as follows:

1, Deer; 2, Bear; 3, Wolf; 4, Beaver; 5, Porcupine; 6, Snake; 7 Hawk; 8, Big Turtle (Mossy Back, or Snapping); 9, Dry Land Turtle; 10, Little Turtle (Water Terrapin).

Finley, as would naturally be expected, enumerates but ten clans. They are as follows:

1, Bear; 2, Wolf; 3, Deer; 4, Porcupine; 5, Beaver; 6, Eagle; 7, Snake; 8, Big Turtle; 9, Little Turtle; 10, Land Terrapin, or Turtle.

It will be observed that Finley calls the Hawk clan the Eagle clan. This was the result of his inaccurate and loose manner of writing.

Why the correct names of the clans of the Wyandots have not been recorded is somewhat remarkable, for up to the time of their departure from Ohio the names could have been obtained without difficulty. When I commenced a search for the Wyandot names of these clans I met with many discouragements. I had no difficulty in getting the desired information concerning the clans in existence, but when it came to the extinct clans it seemed for a long time as though no knowledge of them could be had. I went on many a tour of investigation in this field only to return disappointed. Every old Wyandot was consulted. Finally, at Mr. Splitlog's suggestion, I went with him to some old Senecas that lived on the Cowskin River, and who were married to Wyandot women in Ohio when the tribes lived there side by side. We were unsuccessful here, but these old people directed us to another quarter, and assured us that we could

there obtain the information we sought. It was necessary for me to return to Kansas city, and I had not time to see the persons referred to, at that time, but Mr. Splitlog said he would do so and meet me in Kansas city in a short time, when he would inform me of the result of his mission. It was a month afterwards when he came into my office and informed me that he had been entirely successful. I had carefully instructed him, and he had obtained not only the names of the extinct clans but the description of the animal for which each of the twelve clans was named. It was in this matter as in all others where information is difficult to obtain—after we had solved the problem we found a number of sources from which the desired information could have been procured. The most trustworthy of these was George Wright, who confirmed all that Mr. Splitlog had learned, the only point of difference being the shortening of some of the names and a difference in the accent caused by the dropping of syllables. The following is the list as given by Wright:

1. Big Turtle (Mossy Back). Tēhn-gyowh′-wĭhsh-hīh-yōōh-wah′-nĕh′-rōh-nōh. The people of the Big (or Great) Turtle.

2. Little Turtle (Little Water Turtle, sometimes called "Speckled Turtle"). Tēhn-yĕh′-rōh-nōh. The people of the Little Turtle.

3. Mud Turtle. Yah′-nĕhs-tĕh′-rōh-nōh. The people of the Mud Turtle.

4. Wolf. Tēhn-ah′-rēh-squäh′rōh-nōh. The people of the Wolf or the clan that smells a Bone.

5. Bear. Tēhn'-yoh-yĕh$^{nk'}$-rōh-nōh. The people of the Bear, or the clan of the Claws.

6. Beaver. Tsooh′-tīh-häh-tēh-zhäh′-tōōh-tĕh′-rōh-nōh. The people of the Beaver, or the clan of the House-Builders.

7. Deer. Tēhn-däh′-äh-räh′-rōh-nōh. The people of the Deer, or the clan of the Horns.

8. Porcupine. Yĕh-rĕh′-hĕhseh′-rōh-nōh. The people of the Porcupine, or the clan of the Quills.

9. Striped Turtle. Mäh-nōh-hōōh′kah-shĕh′-rōh-nōh. The people of the Striped Turtle, or the clan that carries the Stripes, (or colors).

10. Highland Turtle, or Prairie Turtle. Yĕh′ tōh-zhōōh′-rōh-nōh. The people of the Prairie Turtle, or the clan that carries the House.

11. Snake. Tēhn-gōh$^{nt'}$-rōh-nōh. The people of the Snake, or the clan that carries the Trail. Sometimes called the "Little Clan of the Horns."

12. Hawk. Tēhn′-dĕh-sōh′-rōh-nōh. The people of the Hawk, or the clan of the Wings.

The following is the list of names of the clans of the Wyandots as procured for me by Mr. Splitlog:

1. Big Turtle, or Great Turtle. Häh′-tēhn-gyowh′-wĭhsh-hĭh′-yooh-wah′-nĕh roh-noh. The people of the Big (or Great) Turtle, or the clan that bears the Earth.

2. Little Turtle (Little Water Turtle, sometimes called "Speckled Turtle"). Gyowh′-wĭhsh-hooh′-tēhn-yĕh′-roh-noh. The people of the Little Turtle, or the clan that keeps the Heavens.

3. Mud Turtle. Gyowh′-wĭhsh-yäh′-nĕh's-tĕh′-rōh-nōh. The people of the Mud Turtle, or the clan that digs through the earth.

4. Wolf. Hah′-tēhn-ah′-rēh-squah′-rōh-nōh. The people of the Wolf, or the clan that smells a Bone.

5. Bear. Hah′-tēhn′-yōh yĕh$^{ngk'}$-rōh-nōh. The people of the Bear, or the clan of the Claws.

6. Beaver. Yoōh-tsōōh′-tĭh-hah′-tēh-zhah′-tōōh-tĕh′-rōh-nōh. The people of the Beaver, or the clan of the House-builders.

7. Deer. Hah′-tēhn-dah′-ah-rōh-nōh. The people of the Deer, or the clan of the Horns.

8. Porcupine. Yōōh-rēh$^{n'}$-hĕh-sah′-roh-noh. The people of the Porcupine, or the clan of the Quills.

9. Striped Turtle. Gyowh′-wĭhsh-yooh-mah′-noh-hooh′-kah-shĕh′-roh-noh. The people of the Striped Turtle, or the clan that carries the Stripes (or colors).

10. Highland Turtle, or Prairie Turtle. Hah′-tah-squah′-yĕh′-toh-zhooh′-roh-noh. The people of the Prairie Turtle, or the clan that carries the House. (Members of this tribe were sometimes called "Shell-shutters" and "House-shutters").

11. Snake. Hah″-tēhn-goh$^{nt'}$-roh-noh. The people of the Snake, or the clan that carries the trail. Sometimes called the "Little clan of the Horns."

12. Hawk. Hah′-tēhn′-dĕh′-soh$^{n'}$-roh-noh. The people of the Hawk, or the clan of the Wings. Sometimes called the "Clan of the Feathers."

The order in which the clans are recorded in the two foregoing lists is the order of precedence of the clans of the Wyandots.[8½] In their march or migration as a tribe they marched "on the Trail of the Snake." What this phrase signifies can now be only conjectured. It may have had reference to the windings of their paths or trails through the forests, or it may have been the office of the Snake clan to select the route of the march in advance of their movement and report it for approval. But I was unable to learn anything definite as to its meaning.[9]

The march was under the immediate direction of the Wolf clan, and was commanded by the chief of the Wolf clan.[10]

Their camp was formed "on the shell of the Big Turtle." It commenced at the right fore-leg and continued around the shell to the right to the left fore-leg in the order of precedence, except that the Wolf clan could be either in the centre of the encampment or at "the head of the Turtle." The tribe was placed in this order, with the Wolf clan "at the head of the Turtle," in the Great Yōōh'-wah-tah'-yoh, by Tsēh'-sĕh-howh'-hŏŏh^{ngk}, and marched out in the order of precedence. In one of the versions of the myth ascribing this retirement to the Yooh-wah-tah'-yoh, this order of precedence and manner of encampment are given.

I subjoin here the order, family, genus and species of the animals used by the Wyandots as totem or clan insignia as they were procured for me by Mr. Splitlog, and they are undoubtedly, in the main, correct.[12]

1. Big turtle. All the turtles were either fresh-water or land animals. One seems to have been either water or land animal, or both water and land animals, living in the water or on the land when he pleased or as his convenience, circumstances, or inclination required. No reference to the sea was ever made by the Wyandots in describing any of the turtles or their habits.

The big turtle is called gyowh'-wĭhsh-hīh'-yooh-wah'-nĕh'; order, *Chelonia*; family, *Chelydridæ*; genus, *Chelydra*; species, *Serpentina*.

He is often spoken of as the mossy-backed turtle, or the mossy-backed fellow. It is the common snapping-turtle.[13]

2. Little turtle. The Little Turtle clan is often called the Speckled Turtle clan. The term little turtle was used to distinguish the clan from that of the big turtle after some of the minor clans were extinct, and the remainder of them given the common designation of "Little Turtle," and spoken of usually as a single clan. But the true little turtle clan was as often called speckled turtle as little turtle. This turtle is usually described as "these little spotted fellows that crawl up on logs, stones, sticks in large numbers to sun themselves.[14] Reference to this habit is made in the myth of the creation of the sun; the cloud contained lakes, ponds, etc.

The little turtle is called by the Wyandots gyowh-wĭhsḥ'-yah-nĕh'-stĕh, the turtle that carries his spots. It is also called Keeper of the Heavens; and also the Turtle that carries the Fire. Order, *Chelonia*; family, *Emydidæ*; genus, *Chelopus*; species, *Guttatus*.[15]

3. Mud turtle. This turtle is the soft-shelled turtle that buries itself in the mud of lake or river beds. It is spoken of as "the fellow

that digs in the ground" (or mud). Order, *Chelonia*; family, *Tryonychidæ*; genus, *Amyda*; species, *Mutica*.[16]

4. Wolf. The wolf is the black timber-wolf found in the forests of eastern North America. Wyandot name, häh'-näh'-rēh'-squäh—he smells (sniffs) a bone; an allusion to his ravenous nature. Order, *Carnivora*; family, *Canidæ*; genus, *Lupus*; species, *Occidentalis*.[17]

5. Bear. The common black bear. Its Wyandot name is hähn'-yōhn-yĕh^{nk}. This name is supposed when pronounced by a Wyandot, or any one else, properly, to be an imitation of the whine of the young bear. The clan reference is to its strong claws. Order, *Carnivora*; family, *Ursidæ*; genus, *Ursus*; species, *Americanus*.[18]

6. Beaver. The Wyandot name is tsōōh'-täh-ĭh, and the clan reference is to its building houses in places prepared for that purpose—more properly, perhaps, village-builders. Order, *Rodentia*; family, *Casto*; genus, *Castor*; species, *Fiber*.[19]

7. Deer. The deer common to eastern North American forests. Wyandot name, skäh-nōh'-tōh, formerly ough'-skŏōh-nŏōh^{ngk}'-tŏōh^{ngk} and the clan reference is to its horns, indicative of power, ability to fight, pride. Order, *Ungulata*; family, *Cervidæ*: genus, *Cervus*; species, *Virginianus*.[20]

8. Porcupine. The porcupine is the eastern species of semi-arboreal North American porcupine. Its Wyandot name is tsēh'-nĕh-kah'-äh. The clan reference is to its sharp quills. Order, *Rodentia*; family, *Sphingurinæ*; genus, *Erethizon*; species, *Dorsatus*.[21]

9. Striped Turtle. The Wyandot name of this turtle is gyowh'-wĭhsh-ōōh'-zhōōh'-tōh. The name does not signify "striped turtle" but a turtle of a peculiar color, and also one that can travel through the woods. The literal translation of the name is "the wood turtle of the peculiar color," or the "strange color"; and it may have been called "striped turtle" because of its striking color or because of some habit or circumstance unknown to us. Mr. Splitlog called it the leech turtle. The clan allusion is to its peculiar color. Order, *Chelonia*; family *Emydidæ*; genius, *Chelopus*; species, *Insculptus*.[22]

10. Highland turtle, or prairie turtle. This turtle is always spoken of as the box turtle, or highland turtle. This is the only land turtle clan, or highland turtle clan ever in existence among the Wyandots. The Wyandot name of this turtle is häh'-täh-squah', and signifies a "house-carrier," and the clan reference is to this name. Governor Walker calls this the dry land turtle. Order, *Chelonia*; family, *Emydidæ*; genus, *Emys*; species, *Meleagris*.[23]

11. Snake. The Wyandot name of this mythical Snake is yähn-goohnt'. He had four legs! The Snake clan is an offshoot from the Deer clan. The name, horns, and form of the snake were fixed to

keep in memory this relationship, for the snake had the horns of the stag, and the snake clan was sometimes called the "Little Clan of the Horns." The clan allusion is to the location of the trail of the march in migrations. Whether it was the office of the Snake Clan to discover and point out the trail I cannot say. In the absence of any direct descendant of this snake the Wyandots reverenced the rattlesnake as a wise and discreet relative of the mythical ancestor of one of their largest and most important clans.[24]

12. Hawk. Like the snake the hawk is largely mythical. It is spoken of as hawk, eagle, and often simply as the big bird, or chief of birds. But the condition is not the same as that of the snake, for a certain kind of bird is designated as the direct descendant of this ancient bird. Even with Mr. Splitlog's assistance I was not able to specify this bird beyond question. Cooper's hawk is nearer the description than any other, and I have little doubt that it is the bird meant, although I have sometimes thought the Wyandots described the sparrow hawk. The eggs of the hawk were usually spoken of and described as being blue and unspotted. The clan allusion is to the wings of the hawk. Wyandot name, yähn-dĕh'-sōh; order, *Accipitres*; family, *Falconidæ*; genus, *Accipiter*; species, *Cooperi*.[25]

Some of the minor turtle clans were the first of the Wyandot clans to become extinct. The Prairie Turtle clan became extinct in Ohio, about the year 1820. An old woman was the last member of this clan. She died at Upper Sandusky, and George Wright saw her buried; he was then a good sized boy. She declared she would be the last of her clan; that her clan should be buried with her. If she had desired to do so she could have perpetuated it by adopting some members of other clans if they would have consented; or she might have adopted white persons.

Just before the removal from Ohio the few members of the Little Turtle, Mud Turtle, and Striped Turtle clans began to be called by the general name of Little Turtle, to distinguish them more readily from the Big Turtle clan which yet contained many members. The Mud Turtle and Striped Turtle clans did not have any separate existence in Kansas, although there were a few members of each clan in the tribe; they were called Little Turtles.

The Beaver clan became extinct in Kansas. James Washington, one of the principal men of the tribe, and principal chief more than once under the elective chieftancy, was the last member of the Beaver clan. He died in Wyandotte County, Kansas, December 1, 1852.[26]

The Hawk clan became extinct either immediately before, or immediately after the migration from Ohio; some say before—others say a few of them still lived when they came west.

The extinct clans of the Wyandots are: 1, Mud Turtle; 2, Beaver; 3, Striped Turtle; 4, Highland Turtle, or Prairie Turtle; 5, Hawk.

The existing clans in the Wyandotte nation are as follows: 1, Big Turtle; 2, Little Turtle, or Speckled Turtle; 3, Wolf; 4, Bear; 5, Deer; 6, Porcupine; 7, Snake.

The separation or division of the tribes into two or more groups was common to the Iroquoian people. Each division contains a certain number of the clans of the tribe, and is called a phratry. Major Powell enumerates four phratries which he says existed in the Wyandot tribe. They are as follows:

First phratry: 1, Bear; 2, Deer; 3, Striped Turtle.

Second phratry: 1, Highland Turtle; 2, Black Turtle, 3, Smooth Large Turtle.

Third phratry: 1, Hawk; 2, Beaver; 3, Wolf.

Fourth phratry: 1. Sea Snake; 2, Porcupine.

Major Powell's informant was as much in error in this respect as in that of the clans.

John W. Gray-Eyes gave the Bureau of Ethnology a list of the Wyandot clans, and the phratries of the tribe. This list is as follows:

First phratry: 1, Big Turtle; 2, Small Striped Turtle; 3, Deer.

Second phratry: 1, Smooth Big Turtle; 2, Bear; 3; Beaver.

Third phratry: 1, Porcupine; 2, Snake; 3, Hawk; 4, Highland Turtle.

This is as far from being correct as is the list of Major Powell. I have the diary or journal kept by Mr. Gray-Eyes for many years. Here is what he says in it of the phratries:—

"Names taken of the different bands or tribes who are voters of tribe conventions, the names of the tribes yet in existence in the Wyandotts are as follows:—1st. The Porcupine; 2nd, the Beare; 3rd, the Deer; 4th, the Big Turtle; 5th, the Specle Turtle; 6th, the Snake; 7th, the Woolf, and the tribes have become extinct are as follows:— the Hawk, the Beaver and the Highland Turtle, and when in full there were ten tribes. These tribes are again divided in plattoones in threes. 1st, the Beare; 2nd, the Deers; the 3 Snakes; and the Big and Speckle or Small Turtles and the Porcupine forms another plattoones, the 1st, Hawk; 2nd, the Beaver; 3rd, the Highland Turtle makes the third divition. The woolf stands an independent tribe, and holds a Cousin relation with all the different Tribes, and is by all regarded a General mediator in cases of controversies between any [of] the tribes.

"And now the present plattoones are as this:—

The 1st, Beare,	The Big Turtle,
" 2nd, Deer,	" Small Turtle,
" 3rd, Snakes,	" Porcupine,

and the Mediator the Woolf makes the 7th in number."

It will be observed that the "potts," or "messes," as he has elsewhere called the phratries in the first classification, do not correspond to the "plattoones" of the second classification. His last classification is correct, and the one now existing in the tribe.

There never at any time existed more than two divisions or phratries in the Wyandot tribe. And the Wolf clan always stood between the divisions, bearing the relation of cousin to each of them, and belonged to neither division, but was always the executive power of the tribe and the mediator or umpire between the divisions and between the clans.

The ancient divisions of the tribe are as follows:—

First division. 1, Bear; 2, Deer; 3, Snake; 4, Hawk.

Second division. 1, Big Turtle; 2, Little Turtle; 3, Mud Turtle; 4, Beaver; 5, Porcupine; 6, Striped Turtle; 7, Highland Turtle, or Prairie Turtle.

Mediator, executive power, umpire, the Wolf.

This classification is correct beyond the possibility of doubt. In ancient times marriage was prohibited between the clans of a division. This law was modified so that the prohibition applied to members of the same clan only. The ancient law of marriage will be understood when we consider that the clans belonging to a division bore the relation of brother to each other. The clans of one division bore the relation of cousin to the clans of the other division. The law prohibiting marriage between all but the clans of the opposite divisions of the tribe was abolished before the Methodist missionaries went amongst them.

Wyandot Government.

The principles of Wyandot government are well laid down by Major Powell, although there are some errors of minor importance. He follows Finley, and Finley was never to be wholly relied upon.[26½]

The present Wyandot government, in the Indian territory, is based on the ancient divisions of the tribe. An extract of the constitution adopted September 23rd, 1874, may be of interest:—

"It shall be the duty of the said Nation to elect their officers on the second Tuesday in July of each year. That said election shall be conducted in the following manner. Each tribe, consisting of the following tribes:—The Big and Little Turtle, Porcupine, Deer, Bear and Snake shall elect a chief, and then the Big and Little Turtle and Porcupine tribes shall select one of their three chiefs as a candidate for Principal Chief. The Deer, Bear and Snake tribes shall also select one of their three chiefs as a candidate for Principal Chief; and then at the general election, to be held on the day above mentioned, the one receiving the highest number of all the votes cast shall be

declared the Principal Chief; the other shall be declared the Second Chief. The above named tribes shall, on the above named election day, elect one or more sheriffs.

"The Wolf Tribe shall have the right to elect a Chief, whose duty shall be that of Mediator?

"In case of misdemeanor on the part of any Chief, for the first offence the Council shall send the Mediator to warn the party; for the second offence, the party offending shall be liable to removal by the Mediator, or Wolf and his Clan, from office."

This has always been the position of the Wolf Clan.

Anciently the office of Principal Chief was in a manner hereditary in a clan, but if the heir was considered unfit to exercise authority he was passed over, and a chief selected from the tribal council. In this event the chief was first nominated by the Chiefs of the Big Turtle, Bear and Deer clans, though not necessarily from any one of their own clans, and never from the Bear clan. Thus the last Sähr-stähr-rāh'-tsēh of the tribe was of the Deer clan, and was known to the white men as the Half King; he died at Detroit in 1788, and was succeeded by Tarhe of the Porcupine clan. Tarhe was selected because of his ability. Governor Walker says of the Half King:[27]

"He inherited his position—good man—a Catholic. After his death the chieftainship which had previously been confined to his tribe and family selected Tarhe of the Porcupine tribe on account of his abilities, good conduct, purity of character and general fidelity, as head Chief; and it continued in that clan till the head Chief became elective."

The inheritance of the sachemship was not changed until after the defeat of the Indians by Wayne, the Wyandots say.

Wyandot Proper Names.

All the proper names of the Wyandots were clan names. The unit of the Wyandot social and political systems was not the family nor the individual, but the clan. The child belonged to its clan first—to its parents afterwards. Each clan had its list of proper names, and this list was its exclusive property which no other clan could appropriate or use. These were necessarily clan names. They were formed by rigid rules prescribed by immemorial custom, and no law of the Medes and Persians was so unchangeable, so rigidly enforced was custom by the Wyandots. Custom was inflexible—exacting—and could be modified only by long and persistent effort (and then but by almost imperceptible degrees), or by national disaster. The customs and usages governing the formation of clan proper names demanded that they should be derived from some part, habit, action or some peculiarity

of the animal from which the clan was descended. Or they might be derived from some property, law, or peculiarity of the element in which such animal lived. Thus a proper name was always a distinctive badge of the clan bestowing it.

When death left unused any of the original clan proper names, the next child born into the clan, if of the sex to which the temporarily obsolete name belonged, had this name bestowed upon it. If no child was born, and a stranger was adopted, such name was given to the adopted person. This was the unchangeable law, and there was but one exception to it. When a child was born in connection with some extraordinary circumstance, or bearing some distinguishing mark, or when a stranger so marked was adopted, the Council-women of the clan, who stood at the head of the clan and regulated its internal affairs, informed themselves of all the facts and devised a name in which they were embodied. This name was made to conform to the ancient law governing clan proper names, if possible: but sometimes this could not be done. These special names died with their owners.

The parents were not permitted to name the child. The clan bestowed the name. Names were given but once a year, and always at the ancient anniversary of the Green Corn Feast. Anciently, formal adoptions could be made at no other time, and until within the last forty years, names could be given at no other time. The name was bestowed by the clan chief. The clan chief was a civil officer of both his clan and the tribe, and he was a member of the tribal council. He was selected by the council-women of his clan. At an appointed time in the ceremonies of the Green Corn Feast, each clan chief took an assigned position, and parents of his clan having children to be named filed before him in the order of the ages of the children to be named. The council-women stood by the clan chief, and announced to him the name of each child presented. The chief then bestowed the name upon the child. This he could do by simply announcing the name to the parents, or by taking the child in his arms and addressing it by the name.

The formal adoption of a stranger might be accomplished in the simple ceremonial of being presented at this time to the clan chief by one of the sheriffs, (as we might call them, and as they are now called by the Wyandots.) He must have been previously adopted into some family of the clan. The clan chief bestowed a name upon him (one that had been previously prepared by the council-women), welcomed him in a few well chosen words, and the ceremony was complete. Or the adoption might be performed with as much display, ceremony and pomp as the tribal council might, from any cause, decree. The tribal council generally controlled the matter of adoptions, although

it never opposed the adoption of a person determined upon by any tribe. It could not prevent the adoption by any clan of any one if the clan chose to assert its rights. But there was rarely any disagreement upon this matter between the tribe and the clan.

A man (and perhaps a woman) might have two names, sometimes more. He was not prohibited from assuming an additional name. The tribal council might order a special name to be bestowed upon him for distinguished services to the nation. But these were only incidental names and he might be called by them or not, as his fellows chose. His clan name was his true name, and while he might have others, he could not repudiate it nor cast it aside. Whatever he was to his tribe, or to others, he was to his clan only what his clan name indicated, and was almost always so called. Any additional names he might possess died with him; they were never perpetuated.

This manner of naming was advantageous. A man disclosed his clan in telling his name. The clan was his mother; he was the child of the clan; his name was his clan badge and always a sure means of identification.

When first visited by white men the Wyandots had a well-developed and well-defined system of mythology. This is shown by their clan-proper names. All the clan animals had their mythical traits, attributes and actions imbedded in clan-proper names. The most tenacious and unchanging words in the Wyandot language are the names of persons, peoples and places.

It is now almost impossible to obtain many name-meanings. The Wyandots themselves do not remember them, so far away from their ancient language and customs have they gone. I have been able to preserve a few of the ancient Wyandot clan-proper names and their meanings. I give them below.

1. Deer Clan. Hähng′-gäh-zhooh′-täh. When the deer runs his tail is up.

2. Deer Clan. Shäh′-rähn-täh. The young buck drops his spots, *i. e.*, the fawn changing color.

3. Deer Clan. Dēh′-hĕhn-yähn′-tēh. The rainbow. [29]

4. Deer Clan. Hähr′-zhäh-tŏŏh$^{ngk.}$ He marks, *i. e.*, the big buck comes to the mark to meet all comers of his kind of whatever number or size. [30]

5. Porcupine Clan. Däh′-räh-hŏŏh$^{ngk.}$ He throws up his quills or the porcupine in the act of throwing up his quills for battle when angry.

6. Deer Clan. Tōōh-kwäh′-nah-yōōh′-teh. She speaks fair, or her words are beautiful, or her words float like clouds.

7. Snake Clan Sēhts-ah′-mäh. Holding a flower.

8. Deer Clan. Tōōh-nĕh's.' A pond: a deer-lick.

9. Deer Clan. Kāhn'-dāh-owh$^{ngk.}$ The old doe.

10. Bear Clan. Shäh'-täh-hooh-rohn'-tēh. Half the sky.

11. Porcupine Clan. 1st. name: Ōhn-dōōh'-tōōh. The meaning of this name is lost. 2nd. name: Stīh-yĕh'-stah. Carrying bark, *i. e.*, as the porcupine carries it in his pocket-like jaws from the top of the hemlock, where he has been feeding.

12. Clan unknown. Yän-nyāh'-mōh-dĕh'. Meaning of the name unknown. He was the last full blood Wyandot, and died in Canada about 1820. So say the old Wyandots.

13. Big Turtle Clan. A negro. Was captured in Greenbrier county, (now) West Virginia. Bought by Adam Brown, Chief of the Wyandots, and was adopted. Named Sōōh'-quĕhn-täh'-rah-rēh. Means the act of the Big Turtle in sticking out his head when it is drawn into his shell. A good translation would be "He sticks out his head." See Finley's "Wyandot Mission" for information about him. For the peculiar manner of his interpreting John Stewart's sermons see "Grandmother's Recollections" in *Western Christian Advocate* about 1897. The Wyandots confirm what is there said.

14. Famous Wyandot preacher at the Wyandot mission, and one of the first converts to Methodism. See Finley. His name should have been written Mäh-nŏōhn'-kyōōh. Big Turtle Clan. Meaning of name lost.

15. Porcupine Clan. Neh-nyeh'-eh-seh. Meaning of name lost. A tall woman. Davis-Mohawk.

16. Porcupine Clan. Skäh'-mĕhn-däh'-teh. Meaning of the name is lost. She married George Armstrong and is said to have been a termagant.

17. See Finley's "Wyandot Mission" for information about him. He was a famous native preacher, and a man of strong character. Säh-yōōh-tōōh'-zhah'. Clan and meaning of name lost.

18. Wolf Clan. Häh-shēh'-trah. The foot-print of the wolf.

19. Little Turtle Clan. Däh'-tēh-zhōōh'-owh$^{ngk.}$ Meaning of name lost.

20. Deer Clan. Mĕhn'-dih-deh'-tih. Means the echo; the wonderful talker; what she says goes a long way and then comes back again.

21. Porcupine clan. Rēh'-hōōh-zhah.[12] Means the porcupine pulling down the branches and nipping off the buds and bark.

23. Deer Clan. Nēhn'-gāh-nyohs. It describes the act of a deer throwing up its hair when angry.

23. Bear Clan. Tĕh-hōōh'-kah-quäh-shrooh. Means "Bear with four eyes." So called because he wore spectacles when he was adopted.

24. Snake Clan. Nyōōhn-dōōh'-tōhs. Meaning of name lost.

25. Snake Clan. Squäh′-skah--rōh. She moves quickly; or she moves suddenly; or she turns unexpectedly.

26. Snake Clan. Tĕh-hōōh′-mäh-yĕhs′. Means "you cannot see him; or invisible."

27. Clan unknown. Mĕh′-rōōh-tōhn′-quäh. Meaning lost.

28. Snake Clan. Dāh′-nyōōhn-dēh$^{k'}$. Meaning lost.

29. Clan unknown. Name, Käh-wēh′-tsēh. Meaning unknown to me.

30. Clan unknown to me. Name, Zhäh′-häh-rēhs. Meaning unknown to me. Formerly Mary Peacock; married Peter Bearskin.

31. Clan unknown to me. Name, Yōōh-mŭh′-rēh-hōōh′. Meaning unknown to me.

32. Snake Clan. Name, Yäh′-äh-täh′-sĕh. Means, "A new body." Said of the snake when she slips off her old skin, as snakes do once a year. Her second name is Oōh-däh′-tōhn′-tēh. Means "She has left her village." One of the first (if not the very first) names for women in the list belonging to the Snake Clan. See note 24.

33. Clan unknown to me. Name, Dīh-ĕh-shĕh^{nk}. Meaning unknown to me.

34. Clan unknown to me. Name, Mĕh′-nōōh-nĕh′-tah. Meaning unknown to me.

35. Big Turtle Clan. Tēh-shōhnt′. Strawberry, or the turtle's eye. The Big Turtle has a strawberry-colored eye.

36. Big Turtle Clan. Kyōōh-dĕh′-meh. Meaning of this name is lost.

37. Snake Clan. Tsōōhn′-dĕhn-dēh$^{k'}$. Means "We clothe the stranger," or literally, "The Snake receives and clothes the stranger." She was a Pennsylvanian, and a teacher at the Wyandot mission. Married Francis Driver; after his death she married Francis A. Hicks; came to Kansas with the Wyandots in 1843. Buried in Huron Place cemetery.

38. Big Turtle Clan. Husband of the above mentioned. Tĕh′-häh-rōhn′-yōōh-rĕh′. Means "Splitting the sky," *i. e.*, the Big Turtle is rushing across the sky, dividing it with his course.

39. Clan unknown. Tōōh′-nōh-shäh′-tĕh. Meaning lost.

40. Big Turtle Clan. Through his mother he was descended from the famous Madame Montour. Born near Detroit, in Wayne county, Michigan, March 5, 1800; came to Kansas in 1843. He was a man of education, refinement, and great force of character. Less than one-fourth Indian. In 1853 (July 26th) was elected provisional governor of Nebraska Territory. Had two names. First, Sēhs′-täh-rōh (more properly Tsēhs′-täh-rōh). Means "Bright," or "The Turtle's eye as it

shines in the water." Second name, Häh-shah′-rēhs. Means "Over-a full," and refers to a stream at flood, or overflowing its banks.

41. Porcupine Clan. Daughter of Silas Armstrong, sr. Name, Yōōh′-rēh-zhēh′-nōhs. Means "The wind blows it over." Refers to the wind blowing up the long hair of the porcupine.

42. Porcupine Clan. Sister of above mentioned. Name, Měhn′-tsĕhn-noh. Meaning lost.

43. Porcupine Clan. Daughter of Mrs. Morris. Name, Kāh′-yōōh-dĭhs′āh-wäh′.[2] Meaning lost.

44. Founder of the Wyandot mission at Upper Sandusky, Ohio. Adopted into the Bear Clan. Name, Rēh′-wäh-wĭh′-ĭh. Means, "Has hold of the law." In his books, Finley does not write his name properly. He had a nickname: Hah-gyĕh′-rēh-wäh′-nĕh. Means, "Big neck," because, the Wyandots say, he had the neck of a bull.

45. Adopted into the Little Turtle Clan. Name, Yah′-räh-quĕhs′. Meaning lost.

46. Big Turtle Clan. Brother of Governor William Walker. Name, Räh′-hahn-tah′-sĕh. Means "Twisting the forest," *i. e.*, as the wind moves, waves, and twists the willows along the banks of the stream in which the turtle lives.

47. Big Turtle Clan. Name, Towh-hĕh$^{n'}$-shrĕh. Means, "The Turtle sees the light," *i. e.*, when he floats up to the surface of the water.

48. Big Turtle clan. Name, Nyĕh′-mēh-äh. Means "Accomplisher." Refers to the work of the Big Turtle in the creation. Their marriage was in violation of clan law of the Wyandots.

49. Big Turtle Clan. Tōh-rōh^{ng} gyĕh′. Meaning lost.

50. Big Turtle Clan. Tsōōhn′-dĕh-shräh′-tĕn. Meaning is lost.

51. Little Turtle Clan. Trĕh′-hĕhn-toh. Means, "Tree shaking," *i.e.*, by the current, or flow of water against it.

52. Little Turtle Clan. Wäh-trohn′-yoh-noh′-nĕh. "She takes care of the sky," or "Keeper of the heavens."

53. Porcupine Clan. Gwĕh-rīh′-rooh. "Tree climber."

54. Little Turtle Clan. Hēh′n′-toh. The meaning is lost.

55. Married into the tribe and given a little Turtle name. Quĕhn′-dēh-säh$^{k'}$-tēh. Means, vibrating voice, or a voice which goes up and down. The voice intended to be described is the voice of the Little Turtle heard on summer nights. This is very nearly the same as one of the Big Turtle names, which is sometimes written as here spelled, but it has a different meaning in that clan.

56. Bear Clan. Tĕh′-owh$^{ngk'}$. Swimming (female) Bear.

57. Bear Clan. Mah′-shĕhn-dah′-rooh. Meaning is lost.

58. Bear Clan. Tēh′-äh-rōhn′-tōōh′-yĕh. This is the famous name in the Bear Clan. It means, between the logs.

59. Big Turtle Clan. Mĕhn-säh$^{k'}$-tēh. The meaning is unknown to me.

60. Deer Clan. Yäh-rōhn′-yäh-äh-wĭh′. The Deer goes in the sky and everywhere.

61. Deer Clan. Shrīh′-äh-wähs. "Cannot find deer when he goes hunting."

62. Deer Clan. Nähn-dōōh′-zhoh. An old deer.

63. Deer Clan. Tĕh′-skŏŏk-hĕh$^{ng'}$. At (or in) the deer-lick.

64. Wolf Clan. Tōōh′-äh. It means "There," *i.e.*, at the Wolf's house, or the Wolf's position in the tribal camp.

65. Big Turtle Clan. Quĭhn′-dēh-säh′-tĕh. "Two lives," or "he lives in the water and in the air," or "in living he goes up and down." This name is written and pronounced a little differently in the Little Turtle Clan, and has a different meaning.

66. Deer Clan. Māh′-yĕh-tĕh′-hah't. "Stand in the water." Refers to the habit of the deer, which stands in the water in summer to get rid of the annoyance of flies.

67. Wolf Clan. A famous Wyandot Chief. See treaties made with the Wyandots while they were in Ohio. He is said to have been a poor Cherokee. Name, Häh-rōhn′-yōōh. The meaning is lost. His wife was adopted into the Wolf Clan. Name, Yähn′-yōōh-mĕh$^{n'}$-täh. The meaning is lost. Their marriage was permitted because they were both "strangers"—of foreign blood.

68. Big Turtle Clan. Brother of Governor Walker. Name, Wāh′-wähs. It means, Lost Place. The name was given from the following circumstance: His mother was a woman of great influence with all the tribes of the north-western confederacy; she spoke the languages of most of them. It was often necessary for her to attend their councils. She was sent for to attend one of these on one dark night. Her period of maternity was fulfilled. She was expecting confinement, and objected; but the business of state could not wait on the business of nature, and she was put into a wagon, and the journey for the council commenced. In the intense darkness the team left the path and soon was lost in the woods. The result was as she had feared. She was seized with travail, and soon a son was born to her. To commemorate the circumstances under which he was born he was given this name of Wāh′-wähs—Lost Place.

Note "A."

The whole of the Wyandot sociology rested on the clan system This system had its advantages and its faults. Its principal advan-

tage was in its binding the tribe together with a bond of blood. In the Five Nations it was the feature of real strength.

The clan system was responsible for much of the fierce warfare made by one tribe upon another. It was a religious duty to keep the clan full, *i. e.*, every name in the clan list of proper names. No name was allowed in ancient times to become wholly obsolete. The animal from which the clan claimed descent was always angry when these names were not in use, for they were not in his honor To suffer a clan to become extinct was a reproach to the nation or tribe. It was followed by dire calamity. This both the old Wyandots and Senecas have often told me. War was often undertaken to replenish the depleted ranks of a decaying clan. White men were eagerly adopted, and to such an extent had this practice been carried by the Wyandots that after the year 1820 there was not a full-blood Wyandot alive. Few women and girls were slain in battle or tortured as prisoners even in ancient times. They were adopted into the different clans of the tribe.

The Wyandots claim that as late as 1800 at least, the Wyandots and Cherokees made war upon each other for the sole purpose of obtaining women and children for adoption.

Notes on the Clan System of the Wyandots.

1. George Wright said the same, almost precisely the same, to me upon this matter. There can be no higher authority than was Wright. Many years after the Wyandots had told me this I saw some of these ideas much better expressed in an article by Major Powell, but I do not now remember where it was published.

2. The first place is conceded to the Big Turtle by all the Wyandots. There is no precedence and encampment is the form of the shell of the Big Turtle. And he made the Earth (the Great Island).

The Little Turtle Clan is, undoubtedly, the second in antiquity, of the clans of the Wyandots. She spread the Earth brought up by the Toad upon the shell of the Big Turtle to make the Great Island. She is the Keeper of the Heavens, and created the sun, moon, and many of the stars. She controls the element, fire; and the lightning is also subject to her. She rides in the clouds provided by the Thunder God.

That the Mud Turtle is subordinate only to the Big and Little Turtles in point of importance and antiquity has always been maintained by the Wyandots. She dug the hole through the Great Island for the use of the sun. She also made the land for the use of the Little People and for the future home of the Wyandots, while engaged in this work. She is the ruler of that land to which the Wyandots go after death, and where the Little People now preserve the ancient

government of the Wyandots for the use of the tribe as it gathers there from death in this world. The Mud Turtle did not go into the sky with the other animals, but to this land of the Little People in the bowels of the Great Island. She may be found there now. No great creative power or important part in the creation was accorded or ascribed to any but the Turtles.

It has been claimed that the Delawares were at one time a Turtle people. The Wyandots say that the Delawares came with them from the far north, and lived below them on the St. Lawrence river before the war with the Senecas broke out. These tribes were always particularly friendly, and the Delawares called the Wyandots their uncles. It is possible that the Delawares copied the customs of their superiors.

3. This conclusion was reached after many years of patient investigation. I cannot say that it is correct beyond doubt, but I could arrive at no other conclusion.

4. This was the opinion of George Wright. He said that Prairie Turtle clan names were often used by the Mud Turtle Clan after the Prairie Turtle clan became extinct, but they were used by no other clan. He also recited tradition in support of this position.

5. I have this from Mr. Splitlog, and also from Mr. Wright. Their authority was the finding of Striped Turtle clan names in use in the Big Turtle clan after the Striped Turtle clan was extinct; also Wyandot tradition. Among the old generation of Wyandots that came from Ohio to Kansas the ancient traditions of the people were well preserved in the form of songs. The children of that generation remember none of the old pagan songs, but their import only. Few are now left that remember even so much.

6. The Wyandot tradition preserving this event is still well remembered by the old Wyandots in the Indian territory. They have often repeated it to me. Smith Nichols recites the best version.

7. John W. Gray-Eyes gave me this word. I do not regard it as the best word for this use.

8. This word was given me by Smith Nichols. I regard it as the better word. But I have often believed I found traces of two languages in the Wyandot tongue. These words mean practically the same thing, but are nothing alike. And when questioned upon this point the old Wyandots say there was an old Wyandot language, or a sacred language in which much of their lore lay wrapped, and that but few of them could ever understand all of this old tongue. Formerly the "Keepers of the True Traditions" were the custodians of it, and taught it to their successors. Mr. Wright told me that the lore of the Senecas was formerly preserved in this same ancient tongue used by the Wyandots, to a certain extent, and he believed the same

was true of the Cayugas. If he was correct in this (and I do not doubt it to a certain extent) it may be that all the tribes of the Iroquoian family preserved their sacred traditions, songs and myths in a dead tongue, which had formerly been the common language of the family before its separation into distinct tribes and the creation of distinct dialects.

I give here two other words, much the same as the second one, either of which may mean clan or clans. 1. Hōōh-tēh'-tāh-rīh$^{ng'}$ (the last syllable may be pronounced *rah*^{ng}, also). 2. Hōōh'-tēh-rīh'-nyāh-shroon-nŭh.^{gk}

8½. Powell says, in his "Wyandot Government," that "the camp of the tribe is an open circle or horse-shoe, and the gentes camp in the following order, beginning on the left and going around to the right:

"Deer, Bear, Highland Turtle (striped), Highland Turtle (black), Mud Turtle, Smooth Large Turtle, Hawk, Beaver, Wolf, Sea Snake, Porcupine.

"The order in which the households camp in the gentile group is regulated by the gentile councilors and adjusted from time to time in such a manner that the oldest family is placed on the left and the youngest on the right."

This is an error. The order of precedence and encampment is given accurately in my lists. What he says about "beginning on the left and going around to the right" may or may not be correct. If one were standing with face to the encampment it is true; if looking away from the encampment then it is incorrect.

The Deer was the principal clan of the tribe, but this was evidently true only in later times, and perhaps within the time when white men have known something of the Wyandots. In ancient times the Deer Clan must have been inferior to a number of clans, as evidenced by its place in the order of precedence and encampment.

9. George Wright gave me this information. That this is the fact he was positive, but as to the meaning of the term "on the trail of the snake" he could give me nothing.

10. I obtained this from Mr. Wright, and have had it confirmed by other old Wyandots.

11. My authority for this paragraph is Wright.

12. Mr. Wright did not agree entirely with these identifications.

13. There can be no question as to the accuracy of this identification. All the Wyandots with whom I consulted were agreed upon it. The term "Mossy-backed fellow" was given to me by Mr. Wright.

14. That is Mr. Wright's expression.

15. There can be no doubt of the correctness of this identification. I never heard any other so much as suggested in all my investigations of the matter.

16. This is Mr. Splitlog's description and identification. Mr. Wright questioned it and believed it incorrect. He said it was a turtle with a hard shell and not so large as the turtle here described. He said he never saw any of this species except in Canada, and very few of them there. I have not succeeded in identifying and classifying the turtle he described. I am inclined to believe Wright correct, and that this is a Canadian turtle, little known to the later generations of Wyandots.

17. Wright questioned this identification, but I have failed to identify the wolf he described—a yellow wolf, and of double the size of the ordinary wolf, often even larger. They were rare in the Canadian woods even in his day, he said. He described the track of this wolf as being as large as that of a pony, and he declared that he had seen the heads of these wolves that would measure twelve inches from the end of the nose to the top of the skull. He affirmed that his name signified the foot-print of the wolf he described to me. While I cannot confirm his statement, I do not doubt it. He said also that the Wolf Clan of the Delawares was descended from this same wolf which he described.

18. All accounts agree that this is correct.

19. There can be no question as to the accuracy of this identification. The Beaver Clan became extinct in Kansas, although there yet live in the Indian territory some persons descended from males of this clan.

20. If any other species of this family was ever the animal claimed by the Wyandots as the ancestor of this clan, it was so far back in the past that all remembrance of it is obliterated from the Wyandot mind. There can scarcely be a doubt as to the accuracy of this identification.

21. No dispute as to the correctness of this identification.

22. All the accounts I was able to obtain concerning this turtle agree as to its identity. But for all that I have sometimes believed the identification incorrect. Mr. Splitlog was very positive in his belief in the accuracy of this identification, and Wright agreed with him, I had before believed it was an exclusively water turtle.

23. I believe there can be no doubt of the correctness of this identification. Wright produced the shell of one of those box turtles when describing the animal. It was the ordinary land terrapin which I had seen so often in Eastern Kentucky. They are found in great numbers in the present home of the Wyandots.

24. The myth in brief is as follows:

A young lady was selected to become the mother of the new clan. She was sent into the woods to receive the address of all the animals and to choose one for a husband; their offspring was to form the new

clan which was to be named for the animal so chosen. She made no choice, but the snake, by assuming the form of a fair young man, seduced her from her mission. She was his wife; but he could not retain the form of the young man long, and when he assumed his true form of the snake, she fled from him and crossed a great water with the assistance of a man she found on its shore with a canoe. The snake was very wroth when he found she had fled and he pursued her, calling to her to return. She did not heed his cries, and he raised a great storm on the water to engulf her. But Hēh'noh, the thunder-god, came to her rescue, and slew the snake with a bolt of lightning.

The woman was delivered of a number of snakes, and these were the progenitors of the Snake clan.

The act of the woman in leaving her husband's lodge is called Ooh-däh-tōhn'-tēh. It is perhaps the first name for woman in the list belonging to the Snake clan. It means "she has left her village." The act of the snake in calling to his fleeing wife is called Kāh-yōōh'-mĕhn-dah'-täh. It is the first name in the list for men belonging to the Snake clan. It means "calling to one your voice cannot reach," or "calling to one your voice does not influence."

25. The myth of the origin of the Hawk clan is, in brief, as follows:

A young woman was wandering about in a prairie one day when the sky was suddenly overcast. On looking up she saw the king of birds coming down upon her. She fled into a wood and crept into a log, but the big bird seized the log and carried it up to the top of a crag far above the clouds where he had his home. When he was gone the young woman came out of the log and found a nest, and in it two young birds, each larger than an elk. She learned that the big bird had slain his wife in a fury and thrown her down from the crag-top. The big bird assume the form of a young man and the girl was his wife, but she wished very much to escape. She finally thought she might escape by the aid of one of the young birds. She fed the larger one well and he grew rapidly; soon he could fly away a little distance and back again. One day when the big bird was gone she led the young bird to the edge of the precipice; here she suddenly sprang on his back, and the force of her action carried him over the precipice. They tumbled along for a while but finally the young bird spread his wings, caught himself in the air, and flew The girl had prepared a small stick and when he did not go down in his flight she tapped him on the head; then he went down. Soon the girl heard the big bird coming in pursuit, and his trumpetings were of thunder. She tapped the young bird constantly and he soon came to the ground. The girl

jumped from his back and pulled the long feathers from his wings, then fled into a wood and hid in the rocks. The big bird came to the ground and flapped his wings; the result was a hurricane which levelled the forest. He searched for the girl but could not find her. He took his disabled son in his talons and went back to his crag. The girl came from her hiding place and gathered up the long feathers she had plucked from the young bird's wings, and went home. When her time was full she was delivered of a number of hawks. They were each given a feather of those from the wings of the young bird. They became the progenitors of the Hawk clan of the Wyandots.

26. He was the last of the pagan chiefs of the Wyandots. But he became a true and humble christian at an early age and so continued until his death.

27. Sähr'-stähr-rähʹ-tsēh was an official title, and the highest originated and conferred by the Wyandots. It is believed that they conferred this title only upon the head chief who gave repeated evidences of bravery and high executive ability. Many chiefs could never attain this high rank, as the Wyandots were very jealous of its bestowal.

This title was conferred upon the writer at a feast ordered and held for that purpose in the Indian territory, March 22nd, 1899.

28. Upon this subject my best authority was George Wright. Not that the information which I received from others was inaccurate or unreliable, but that Mr. Wright was so much better informed upon all subjects of this character.

29. This name was given me some years ago when I was first considered by the Wyandots as one of their number. On the 22nd day of March, 1899, I was formally adopted into the Deer Clan of the Wyandot tribe (having been previously adopted into a family of that clan) and "raised up" to fill the rank of Sähr'-stähr-rähʹ-tsēh, which had been vacant since the death of Dähʹ-ōōh^{ng}'-quäht, or the Half King, at Detroit in July, 1788. The clan name of the Half King was Tōōh-dähʹ-rēh-zhōōhʹ, and that name was given me as my clan name. It means: The great Deer; or the Deer that leads; or the Deer that stands above his fellows.

Dähʹ-ōōh^{ng}-quaht is a special Deer Clan name bestowed upon the Half King by the tribal council. It is said to mean "Long Bark."

30. His mother was a Wyandot-Seneca of the Tsäh-dĕhʹ-shrähnyōhʹ-kah or Snipe Clan, and according to a strict construction of Indian kinship he would be a Seneca of that clan. But he is a Wyandot, the son of Matthew Brown, and the great-grandson of chief Adam Brown, who founded Brownstown.

Powell, in his "Wyandot Government," says that the tribal council was composed of one-fifth men and four-fifths women. The Wyandots deny that this was ever true. I doubt its accuracy. All that I have been able to learn on this subject leads me to believe that the tribal council was composed of the hereditary chief of the tribe, the chief of each clan, and such additional warriors of ability and courage as the hereditary chief and council chose to "call to the council-fire." Women were not excluded from the deliberations of the council in certain contingencies, and were often called upon to give an opinion. The oldest Wyandots say that women were never recognized as members of the tribal council. This is the more probable, as the tribal council possessed only delegated and limited authority. The government of the Wyandots, in its functions, was a pure democracy. Questions affecting the interests of the whole tribe were determined by it in general convention, and men and women alike were heard, and voted, the majority ruling.

In the tribal council the vote was anciently by clans, the hereditary chief calling upon them in the order of precedence and encampment, the "calling of the clans" being the word "*Ōh-heh'*" and the response of the clan chief being *H-ē-ē-eh'-zōōh*, if voting in the affirmative. If assent of the clan was not given the clan chief remained silent, and no "voice" was heard. In ordinary matters if the "voice" of a majority of the clan chiefs was heard the proposition was carried, but in matters of great moment unanimity was necessary. The number of "voices" heard was reported to the head chief by the Wolf, *i.e.*, the clan chief of the Wolf Clan, and by the head chief announced to the council. In arriving at his decision the clan chief consulted the warriors of his clan that were members of the tribunal council. He might consult other members of his clan. A question was rarely voted upon until at least one day had elapsed after its proposal. The tribal council did not necessarily consist of any certain number of persons

In voting in the general convention of tribes the account was kept with grains of corn, white being affirmative and red or blue negative. The vote was "taken" by the Wolf, who gathered them in two bark receptacles. They were counted by the tribal council and the result was announced to the convention by the Wolf. George Wright informed me that he had attended general conventions of the tribe in Ohio where the vote was thus taken.

Concerning the head chief, or hereditary chief, Powell says that he was formerly of the Bear Clan. If this be true, it was so far in the past that none of the Wyandots that left Ohio for the west remembered it; no tradition that this was ever true remained in the tribe, none remains to-day. The Bear Clan was always a turbulent, re-

fractory and troublesome clan. It was often disciplined by the tribe, so I was informed by Wright and other old Wyandots. While it had individual members held in esteem in the tribe and noted for courage and intelligence, as a clan it was to a certain degree degraded and held in contempt. The office of head chief was hereditary in the Deer Clan back to the time of the remotest remembrance, until after the battle with Wayne, where the chiefs of that clan were all killed, with a single exception, they say. Then the tribal council changed it to the Porcupine Clan at the instance of Tarhe of that clan, who had exercised the supreme authority since the death of the Half King in 1788. This change was opposed by the Deer Clan, and many of the tribe considered it an illegal and unwarranted proceeding. Only the great ability of Tarhe, which was recognized by the whole tribe, caused the action appointing him head chief to be acquiesced in. Many of the Wyandots regard the Deer Clan hereditary chief the true sachem of the tribe to this day. In this succession, Smith Nichols, living at the present time in the Seneca Nation, and married to r Seneca woman, is the hereditary chief of the Wyandots.

While the sachem was, in a manner, chosen by the tribal council, the choosing was more in the manner of a "raising" than a real selection of a person to fill the office. The council was restricted to the clan and family in this choosing, and unless some good reason could be shown the chief by heredity was never passed over.

The Dooh'-seh-ah'-nêh, or the Origin of the Êl'-lên-na'-pa, (Delawares.)

(*According to Wyandot Tradition.*)

The Wyandot calls the Delaware his nephew and the Delaware calls the Wyandot his uncle. The Wyandot had as a tribe no other nephew than the Delaware, and the Delaware had no other uncle than the Wyandot How this relationship came to be recognized can perhaps never be ascertained. The Wyandot name for the Delaware does not explain it, and has no reference to it in its interpretation. This name is dōōh'-sēh-ah'-nĕh, while the Wyandot word for nephew is hĕh-wah'-tah.

The terms were evidently the result or incident of some treaty between the tribes, and probably of considerable antiquity, although the absence of any reference to this relationship in the Wyandot name of the Delawares would seem to indicate that it was of modern origin. The Wyandots have the following myths (possibly legends) upon this subject. As they relate also to the origin of wampum it may finally be determined that the relationship is of long standing. In relating

the story the Wyandots always commenced—"Long before the Wyandots came to the country where Quebec and Montreal now stand." The myths are as follows:

"It came about in this way. The young woman who was to become the mother of the future head chief of the Wyandots belonged to the Big Turtle clan. She was comely and well favored, She was headstrong and rebellious. Her father selected from a proper clan a young man to become her husband. In this selection reference was had to the wishes of the young woman, for it was the custom to select an older man for a girl of her age. More from the perversity of her disposition than from her real feeling she scorned and refused the man she had caused to be selected. She went away with another Wyandot and lived in his lodge.

This action of the young woman enraged her family and her clan as well as the tribe. Her clan sought to slay her. She and her husband were compelled to flee far away from their tribe to escape death. The office of head chief was taken from the Big Turtle clan and made hereditary in the Deer clan.

The young woman and her husband lived in a strange land. They had many sons and daughters. These married the people of the land in which they were born. In the course of time the descendants of this Wyandot girl and her husband formed a great people. In their migrations they encamped near the land of the Wyandots. The Wyandots had no recognition for them but did not make war upon them."

The Wampum Bird.

The villages of the Wyandots stood about a beautiful lake. One day a maiden went from the village to a marsh to get some cranberries. When she came to the marsh where the cranberries were growing she saw a great bird, half a tree tall, fierce and of frightful mien. This bird was feeding upon the cranberries of the marsh, and seemed incapable of rising to fly away.

The maiden was greatly frightened at what she believed to be a hōōh'-kēh' bird. She ran to the village and told the chief about the strange bird she had seen in the cranberry marsh. The Wolf sounded the great shell and the council was immediately assembled. Fear was in all the village.

The council caused medicine to be made. It was found that this fierce bird in the marsh where the cranberries grew was the wampum bird, the first of its kind ever seen in this lower world. It was determined that the bird must be killed and the wampum obtained.

All the warriors went with the chief to slay the wampum bird. It was devouring the cranberries. So fierce and desperate was it that

the warriors could not approach it with their clubs. The chief said to the warriors: "He that kills the wampum bird with an arrow shall have my daughter to wife."

The maiden, the chief's daughter, was much desired by the warriors. They shot their arrows at the wampum bird. When an arrow struck the wampum bird it stood up its full height and shook off all the wampum with which it was covered. This precious substance fell in showers like rain all about the warriors. In an instant the bird was again covered with wampum which was its only plumage. The purple wampum covered its wings; on the remainder of its body was the white wampum.

No arrow shot by the warriors could kill the wampum bird. While they were shooting, a youth came through the woods to where they stood. He was of a strange people. The warriors wished to kill and scalp him. The chief permitted him to shoot at the wampum bird. He cut a slender willow from the marsh. From this he fashioned an arrow which he shot. None of the warriors saw the arrow leave the bow of the young man, nor did they see it strike, but the wampum bird was dead in an instant. The arrow was found piercing its head through the eyes. The Wyandots secured more wampum than could be placed in the largest lodge in their village.

The warriors carried the youth to their village. They still wished to kill and scalp him, for they had not been able to kill the wampum bird. The chief said to the young man: "My son, tell me from whence you came." He replied that he was a Delaware. He said his people lived in a village which was not far away.

The council sent the young man to bring his people to a great council which it appointed. At this great council the Wyandots recognized the Delawares as their nephews. A treaty was made which has not been broken to this day. The young man was given to the Wyandots and by them adopted. He was given the wife he earned by killing the wampum bird.

This treaty was confirmed between the parties to it by giving back and forth strings of the wampum secured from the wampum bird slain by the young man. Since that day no treaty has been concluded by the Wyandots without the passing of the wampum belt.

The Wyandots and their nephews, the Delawares, lived side by side a long time. Then they came from the north land to live on the banks of the St. Lawrence.

THE WAR OF THE IROQUOIS.*

By M. Benjamin Sulte.

Before entering upon an account of the conflicts which the colony of Canada had to encounter during the 17th century against the Iroquois we must first learn something about the many peoples who, at that epoch, were the hereditary possessors of the greater half of the continent of North America—the Nations, with whom the early discoverers and explorers came in contact— after which we shall the more readily understand something of the bitter antagonism of the Iroquois against French exploration and French colonial expansion.

Following a map of the times, and leaving eastern Pennsylvania, crossing Connecticut, Rhode Island, Massachusetts, New Hampshire, Maine, New Brunswick, Nova Scotia, all the Province of Quebec, the River Ottawa, Lake Nipigon, the Sault Ste. Marie, Lake Superior Wisconsin and Michigan, Indiana and Ohio, we find ourselves in a vast circle held by Algonkin tribes—wandering bedouins, fishermen and hunters—without stationary homes or lodges; lacking high ideals and without a regular form of government. In habit improvident and shiftless, living ever in the present hour and forgetful of the future, with annual sufferings from a rigorous climate which no hard experience taught them to prepare for, they feasted and gorged themselves while abundant harvests in natural luxuriance flourished around them, in turn suffering all the pangs of hunger, starvation and cold from their improvidence. Their language was composed of an infinity of dialects and patois, which rendered the speech of these Arabs of North America a strange tongue to all other nations living beyond a radius of one hundred miles. The purest specimens of the Algonkin language were to be found among the dwellers on the banks of the Ottawa River, on Manitoulin Island, in Wisconsin and Illinois. The physical type was more European than Asiatic, the skin white, not red. It almost appeared as if these people had a common origin and one not so very far different from that of our own. These men, however, were primitive savages, not having the instincts to raise themselves above the level of brute creation and ignorant of their gross ignorance, they were dwellers on the lowest rung of the ladder of humanity.

Now, let us glance within the circle embracing Upper Canada, the State of New York and the north of Pennsylvania. This region was

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* *Translated by Mrs. Mary E. Rose Holden.*—"This translation of Mrs. Mary E. Rose Holden is an honor I highly appreciate, and I take pleasure in adding that I have compared it with the original and cannot expect a more accurate expression of my text from any writer.

Benjamin Sulte.

Ottawa, Oct. 17th, 1889."

inhabited by the Huron-Iroquois race, peoples of sedentary habits, having well-built lodges, villages and towns. Cultivators of the soil, ruled by an effective political and military administration which astonished Europeans.

Thrifty and provident in all seasons, these people lived comfortably, favoured with a beautiful climate, they presented a group of primitive, civilized men surrounded by neighbouring barbarians. If they had been left to the natural law of the evolution of peoples and races they might at the present time have been compared to the empire of ancient Greece. This supposition does not imply that their cruel practices would no longer have been in use; for cruelty towards enemies is the last evil instinct to leave a barbarous people, and parallel cases in cruelty were found even in Egypt, Greece, Rome and Spain, and in all probability the year 1900 would have brought with it to the Huron-Iroquois, if left untouched by European civilization of the 14th and 15th centuries, a civilization similar to that of Mexico and Peru without its luxury, but in as an advanced social condition. The red tint of their skin indicated other source than that of the Algonkin from whom they differed materially in so many respects. It must be admitted that they had taken many steps in raising themselves from a savage condition, through which superiority they held themselves apart from the Algonkin tribes.

Like the Germans, they called themselves "*Allemenn*" (Allemands) "superior men," "*hommes, par excellence.*" Their language was beautiful, full of resource and variety of expression, with few dialects.

Towards the year 1600 the Huron-Iroquois were found dispersed through Upper Canada, the centre of the south-west of the Province of Quebec, wherever was to be found the finest climate.

The tribes living about Lake Simcoe and Georgian Bay were called Hurons by the French on account of the fashion which they followed in dressing their hair. Others were called the Neutrals, and the Tobacco people, or pipe-smokers. These latter stretched towards Goderich, on Lake Huron—the Neutrals towards St. Thomas, on Lake Erie.

East of the two great lakes, at Buffalo, Rochester, Syracuse, Oswego, Utica and Albany, were five tribes whom the French called Iroquois, from the habit which their orators followed of ending their orations in the fashion of Homer's Greeks by saying "Iro," or "Hiro" —"J'ai dit"—ipse dixit. A sixth family inhabited the north of Pennsylvania and were known as the Andastes. The seventh, the Eries, occupied the south-east country of the lake bearing their name. The eighth, the Tuscaroras, stretched into Virginia.

About the year 1600 the Hurons were a powerful people. They numbered three thousand warriors. The Iroquois at that time in

comparison were but "a little nation," having been almost exterminated by their enemies, but we shall soon see that this "remnant of a people, like a fruitful germ, multiplied exceedingly in number and filled the earth." So writes, in 1650, one of the Jesuit fathers.

In all the countries of North America we find history repeating itself—the old story of wars and as to whom shall be the greatest, which has existed upon the globe since the days of Adam and Eve, was now in full force.

The Iroquois branch called the Mohawks, or Agniers, located near Albany, were the greatest warriors of the five groups of which we have spoken. They descended by route of the Chambly river and ravaged the country of the Algonkins, living on the banks of the St. Lawrence, between Quebec and Montreal. Such was the state of affairs in the country when Champlain arrived in Canada in 1603.

The Algonkin country was the first territory reached by the great explorer. It was, therefore, most expedient for him, in the furtherance of future discovery, to form alliance with these people, and as a pledge of his faith in the promises made him of guarding him from personal seizure or loss, and also of furnishing him with guides and protection in western explorations, he joined them in an expedition against the Iroquois, 1609.

Historians have drawn exaggerated conclusions from this so-called rash alliance, even going the length of saying that Champlain rashly attacked the most redoubtable Indian confederacy on the continent of North America. He did not begin the attack, his allies were defending themselves from invasion. It was not the shot of Champlain's arquebus which gave birth to Iroquois antagonism. As well say that Æneas carrying his father into Italy foreshadowed the conquest of the world by the Romans, Let us make note that the Agniers (Mohawks) were not making war against the French, but were at that particular time at war with the Algonkins, and Champlain found himself amid the conflict. It was an unfortunate introduction, yet one which could not have been avoided.

The more fatal step, into which he was afterwards drawn, was that of invading the country of the Mohawks at the head of his Algonkin-Huron allies. Champlain was crippled by enactments and decrees of government from Paris, and unable to follow any independent policy with the native nations. Herein lies the whole root of the matter.

In 1614 the Dutch or Flemings, established a trading post at Orange, the present Albany. The following year a party of Flemings accompanied the Iroquois in an incursion into the country of an ally of the Hurons. Three of the Dutch were taken prisoners, but were

returned in safety to Albany, for the Hurons had told them of the arrival of the pale-faces and of Champlain's alliance with the Algonkin-Hurons made at Quebec. The Flemings were supposed by their captors to be Frenchmen or allies of the French. Were these Europeans supporting the Iroquois in war ?

In 1615 the Hurons invaded the Iroquois country, penetrating as far as Syracuse, in the State of N. Y. Champlain was with them. The expedition was unsuccessful, and was a much more serious affair for Champlain than the encounter on the Chambly river in 1609.

We see clearly, that the Hurons and Iroquois were mighty and hereditary rivals. It is impossible to know from what cause or date this antagonism originated. This fact we do know, that the feud ended only with the wiping out of the Huron villages and towns and the final dispersion of the nation into Lower Canada—forty years later. The Jesuit Relation of 1660, written by Etienne Brulé, furnishes a good account of this anti-fraternal warfare. That priest in 1615 lived with the Andastes (Pennsylvania), and these people of the Huron-Iroquois language were then at war with the Iroquois of Onondaga.

"The five tribes which constituted the Iroquois League, those whom we call " Agnieronons," fluctuated between success and defeat of their foes for a period of over 60 years—a continued series of revolutions of the " fortunes of war," than which we can scarcely find a parallel in modern or ancient history. . . . Towards the end of the 16th century the Iroquois were almost exterminated by the Algonkin-Hurons; nevertheless, the handful left, like a fruitful germ, had multiplied within a few years, who in their turn had reduced the Algonkin to a pitiful number, thus most effectively turning the tables upon their enemies. But this triumph was of very short duration, for the Andastogehronnons, during a ten years' war, had been so successful that the Iroquois for the second time as a confederacy were almost annihilated, and so humiliated, that the name of an Algonkin made them tremble, and the memory of their defeat pursued them even to their council fires."

The defeat of the Mohawks by the Andastes, shows us that the Iroquois as a confederation, if already in existence (1620-1630), was not yet in such a position as to afford succour to any one of the several tribes of the league when seriously menaced by a foe. The Relation continues: " At this time the Dutch were allies of the Mohawks, having for 30 years carried on the fur trade with them." The Relation of 1637 p. 158, et 1647, p. 8 gives the following: " The savage d'Andastohe, of neighbouring Virginia had at one time alliance with the Hurons, many of whom settled in their country. The Andastes lived on the shores of the Susquehanna. They stretched to the sea, from

which they brought back shell-fish, which they exchanged for other commodities with the inland tribes—from which they have been called the "porcelain people."

The five nations of the Iroquois Confederacy have been ranked as nearly as possible as follows: Agniers (Mohawks) to the north of Albany and the Schenectady; Onneyouts (Oneidas), back of Oswego; Onnontagués (Onondagas), towards Syracuse, N. Y. Central; Goyogonins (Cayugas), near Rochester; Tsonnontonans (Senecas), east of Buffalo. The Eries following the length of the greater part of Lake Erie near Cleveland and Sandusky.

Champlain wrote: Iroquois, Irocois, Yrocois; the Jesuits: Hiroquois, Iroquois. The Dutch called the Agnier, Maquois; the English made it Mohawks. When the Algonkins saw the Iroquois coming they cried out: "Nattaoué! The enemies."

The advent of the French into Upper Canada was not at first of a nature to alarm the Iroquois, for some of these men were missionaries; others, runners or traders for the peltry trade; but by the year 1634 the number of palefaces had increased to such an extent, that the nations south of the St. Lawrence, becoming alarmed, formed themselves into a political league, called Iroquois by the French. They designated themselves as one body, by the name of *Onguehonwe*: "Superior men dwelling in perfect houses" The strength of this confederacy became more and more firmly consolidated, as the Iroquois realised how they were being surrounded by the pale-faces. To the south of them were the English of Virginia, the Swedes of New Jersey, the Dutch of Manhattan (New York) and Orange (Albany).

The Dutch and New England colonies, bent upon extending their trade, supplied the Iroquois with blankets, firearms and rum, and had built up a profitable connection for themselves.

The finest peltries were to be found in Upper Canada. The Hurons and the Iroquois delivered these to the French. *The Iroquets people of the Algonkin tongue*, who claimed to have once possessed the island of Montreal, occupied the territory between Kingston, Vaudreuil and the Rideau river.

It will be now seen that the Iroquois held a most precarious position. To the north of them their hereditary foes, to the south-east three peoples of European pale-faces from England, Sweden and Holland. Now their extraordinary diplomacy came into play and a political policy was projected by the league in solemn conclave around their council fires, to which they tenaciously held to the last, and which saved them from being overcome by foe or invader. The first step to take in carrying out this policy was to attack the Hurons and their allies, the French. A war not planned on the old bordering raids

and incursions (of 1600-30) into the Algonkin and Huron countries, but a series of aggressive, well thought-out and planned operations against the Europeans, with one view ever in mind, viz: the domination of the Iroquois. Such a national conception was worthy of the genius of a Cæsar.

We must not leave out the Sokokis, of the Connecticut river, and the Wolves, (Mohicans, Mahingans), on both sides of the Hudson, people of the Algonkins, enemies of the Iroquois, who, under the eyes of the Dutch, completely wiped out of existence the Sokokis and Wolves. The captives taken in 1630 becoming adopted into the Iroquois confederacy. Part of the Iroquois policy was to war directly with the native nations, conquer them, incorporating into their league all captives, or lesser tribes or clans fearing extinction, who demanded their protection, or to stir up war between the lesser tribes so that the one might be destroyed by the other. Surrounding the Iroquois were the Abenakes of Maine, the Algonkins of Lower Canada and the Iroquets, the Hurons, Neuters, the Pipe Smokers, Mascoutins and Andastes. A circle of formidable foes to be overcome one after the other, or the one by the other.

The home government of France did not interfere with these plans of the Iroquois, while the English, Swedes and Dutch were largely benefited so far by these successes of the confederacy that the peltry trade of the west was directed to Albany and drifted from Montreal and Quebec without any effort on their part. The French who traded in Upper Canada did not go there to settle, but to trade, and this the Iroquois perfectly understood. The Courreurs des bois and six or eight "black robes," who lived in the depths of the country, and who were looked upon in the light of overseers of the peltry trade by by the Indians, were tolerated, but the Hurons as a people must be destroyed. We might never have read of the martyrdom of the Jesuit missionaries if the dealers in furs had not been living under the shelter of the Hurons. It was in pursuit of the monopoly of the northwestern fur trade that the Hurons were driven from their homes, and in this destruction the French, as the allies of the Iroquois' hereditary foes, suffered such terrible disaster.

During the month of August, 1635, Champlain appealed to Cardinal Richelieu for military assistance to restrain the disastrous policy of the Iroquois, and stated that if sufficient aid were sent out to Canada, that with the assistance of the Hurons the league might be destroyed and the whole peltry trade of the N. and N. W. be controlled by the French. Richelieu did nothing in reply, and Champlain died the 25th December the same year. Canada was now left to itself and desolation through the passive policy of the French crown.

while the Dutch of Albany sold firearms to the Iroquois, who from this date ravaged both Upper and Lower Canada. The war with the Hurons waged furiously from 1636. There is little doubt that the Dutch, Swedes and the Iroquois were well aware that France was at this time engaged in civil war and unable to send out assistance to her colonists. If at that time France had but spared a few of her regiments to assist and strengthen her Canadian colony, neither her army nor her prestige in Europe would have suffered and French rule would have been made secure in North America. History is now (1898-99) repeating itself in Africa in the rival establishments of European commerce, at the same time in the opening up and exploring of the "dark continent" of modern times. If the new comers do not make war themselves, they induce the natives to attack the rival successful traders.

In 1639 the Iroquois exterminated the Wenrohronons, who lived beyond lake Erie more than eighty miles from the Hurons, and were old friends of the Neuters. The Iroquois attacked them in 1639 and dispersed them; more than six hundred of these poor unfortunates perished. A large number of women and children and the aged found shelter with the Hurons and Neuters in a village situated northeast of Sarnia, afterwards called the Mission of St. Michael. These Wenrohronons were a branch of the Eriérohnons, of the Cat people, established near Cleveland and Sandusky, not far from some bourgades of the Neuters, which stretched as far as Toledo after having crossed the river Detroit. Their language was that of the Hurons and the Iroquois. The dispersion of the Eries in 1639 drove the principal group of the Eries into the State of Ohio, where they lived for twelve years in large villages, cultivating the land according to their ancient custom.

The Neuters (Attiwendorons) who had until 1638 kept intact their traditional neutrality between the Hurons and Iroquois, in turn fell before the power of the Iroquois. They had occupied the lands between the Niagara River, Sarnia, Goderich and Hamilton, and numbered (1616) thirty-six villages with a garrison of 4,000 warriors, the same number of warriors in 1641, with a population of 12,000 souls, but this census was much larger a few years previously. On Galinée's map of 1670 was found near the Burlington Heights, City of Hamilton, Ontario, these words, placed at the head of the river: "Ici etait autrefois la nation Neutre." In ploughing the ground in this locality were found in the space of an ordinary farm 800 tomahawks, left there probably at the end of a battle where the people of the locality had evidently been exterminated, leaving no one to gather up the arms. The river in question runs south, empties into Lake Erie at Dunnville, county of Haldimand. At Southwold, county of Elgin,

have been discovered curious ruins of a Neuter village, thought to be the capital city of the Neuter Confederacy. The most important missions established by the Jesuits before 1650 in the Neuter territory are Notre Dame des Anges, near Brantford; St. Alexis, near St. Thomas; St. Joseph, county of Kent; Saint Michael, north-east of Sarnia; and St. Francois, a little east of Sandwich. There were also three or four other towns of the Neuters on the other side of the Detroit river, *i. e.* on the United States side of the river.

The conquest of Upper Canada commenced by a ferocious attack of the Iroquois against the Neuters, carried on in such a manner that the Neuters were unable to contend against it, after which the Hurons were vanquished in their turn, but the extermination of the Neutrals did not take place until 1650, after the total collapse of the Hurons.

From 1639-40 the genius of the Iroquois inspired them with a new plan of warlike operations worthy of comparison with that of Napoleon in 1805. To subjugate, one after the other, the races surrounding them, and arbitrating at the same time the destinies of the French and Dutch settlements on the continent, was their evident policy—a policy which they pursued without faltering during a quarter of a century, that is to say, until the arrival of the Carignan regiment from France. In summing up the tide of affairs at this time, Charlevoix says: "The "Iroquois, assured of being supported by the Dutch who furnished "them with arms and ammunition, and to whom they sold the peltries "which they had seized from the French traders and the Hurons, con- "tinued at this time their predatory exploits of capturing all the peltry "trade on its transit from the west to Quebec and Montreal and Three "Rivers. The rivers and lakes were infested by Iroquois bands, and com- "merce could be carried on only at great risks. The Hurons, whether "through their national indolence, or from fear of their old enemy who "scornfully triumphant over them, treated them with a galling supe- "riorty and contempt of manner, which paralysed all efforts of resistance, "even when their bourgades and frontiers were being razed and burned "to the ground." Father Sagard (1625) named the Hurons "Howandates," from which term has been derived Ouendat, Wyandot and Yandat. They lived between Matchedash and Nottawasaga bays, the river Severn and Lake Simcoe. They cultivated pumpkins, Indian corn, beans, tobacco and hemp. Their principal tribes were the Bear (Antigonantes), the Wolf (Antigonenons), the Falcon (Arendoronons), the Heron (Tahontainnats). (See Dean Harris, St. Catharines.)* According to Champlain the Hurons in 1615 numbered from 20,000 to 30,000 souls, including the Tionnontates, "The Smokers of Tobacco," who lived on the western heights of the Blue Mountains, at the head of Nottawasaga bay, in the township of the same name, two days

* History of the Early Missions in Western Canada, by the Rev. W. R. Harris.

march from the Huron villages. They had nine or ten bourgades, with a population of 10,000. Traces of thirty-two villages and forty bone-pits, or cemeteries, were found in this region. After 1640 the Smokers joined themselves more firmly with the Hurons. The missions of St. John, St. Matthew and St. Matthias were established by the Jesuit Fathers, and became centres of ten or twelve missions scattered through the counties of Simcoe and Grey.

Mr. David Boyle, well known as an authority in these matters says, that these people were more intelligent and more industrious than most of the other savages of North America.

During the month of June, 1641, the Hurons on their annual descent to Three Rivers with their peltries, unexpectedly found the post blockaded by the Iroquois whom they thought away from the scene and busy in another direction, but experience was fast teaching the French, that as soon as one expedition proved successful their indefatigable destroyers feigned a false calm and satisfaction with the exploit, only to appear in the most unexpected direction, and by this means kept up an unceasing warfare. Bands of young Iroquois warriors encouraged by the non-resistance of the Hurons, kept up an incessant series of petty invasions and predatory attacks on the French and Huron settlements.

The Neutrals owed their name to the pacific role which they followed between the many different Huron and Iroquois tribes of the northern and southern countries of the lakes—Ontario and Erie. They did not hold these pacific sentiments regarding other nations, principally the Mascoutins or Fire People of the Algonkin language who lived beyond the Detroit river. This powerful nation claimed sovereighty to the extreme western section of lands on lakes Erie and Huron for the Algonkins—Ottawas, inhabited the county of Bruce and Manitoulin Island. These hostilities were still in existence in 1642. As reported in Relation of 1644, p. 97 : " The Neuters are always at war " with the Fire Nation. In 1642 in number of 2000 they attacked a " palisaded town defended by 900 warriors, who sustained the assault ; " after a siege of 10 days, they raised the siege, took 800 captives, as " many men as women and children ; they burned over 70 warriors, " gouging the eyes and burning the lips off all the old men, who were " afterwards abandoned to wander homeless in their misery."

This was the scourge which was depopulating the country, for with these native tribes, war was but extermination. This nation of fire was more populous than the Neutrals and the Huron-Iroquois taken together. They possessed a large number of villages and spoke the Algonkin tongue in great purity. We may consider the Mascoutins during the years 1615-1666, as the most powerful people of the pre-

sent State of Michigan, lying between the city of Detroit and the Straits of Mackinaw.

The spectacle of these barbarous wars, like those of mediæval Europe twenty centuries ago assumes a geographical aspect, that of a rotatory movement. Circling round lake Huron, the Hurons, the Tobacco Nations, the Neutrals with the Iroquois attacking, on the south the Eries, and Mascoutins; these latter in their turn inspiring terror among the Ottawas of the county of Bruce and Manitoulin island, and as far as the Amikowes (the Beaver) in the Algoma district, over the continent north of lake Huron. Encircling this sheet of water raged these internecine wars which exterminated seven or eight valiant nations, the future spoils of the Iroquois.

The year 1643 is marked by a remarkable change in the strategy of the Iroquois. Up to this date they had approached our settlements in large attacking bands, and then only during the summer season when transport by canoe was available, but from this epoch, they modified their plans and divided their members into bands of twenty, thirty, forty, or one hundred men and in this way spread themselves like a network over all the waterways of the St. Lawrence. "When "a band starts out—writes the Father Vimont—another follows, "little groups of well armed men leave the Iroquois country to occupy the "Ottawa river—to station everywhere crafty ambuscades, from which "they unexpectedly launch themselves upon unsuspecting Montagnais, "Algonkins, Hurons, and French. It was known in France that the "Dutch encouraged the Iroquois in thus harassing the French, for they "furnished them with firearms that they might all the more effectually "force the French out of the country and at the same time abandon the "missions of the Church."

The French colony was now practically without military defence. Still less was it in its power to make war in Upper Canada.

1644. The Iroquois desired above all things to isolate the French from their allies, and in pursuance of this policy formed ten predatory bands of warriors, who over-ran all Lower Canada. Two of these bands held the portages of the Chaudiere and the Rideau (the present Ottawa city). A third watched the Longue Sault. A fourth held lakes St. Louis and the Two Mountains. The fifth intercepted the waterways of the Ottawa. The sixth occupied the island of Montreal. The seventh, eighth and ninth, in flotillas of canoes, held the Richelieu, lake St. Peter, and the neighborhood of Three Rivers. The tenth and last was composed of a large flying column of warriors, a formidable reserve with which to attack the country of the Hurons.

In the spring of this year Father Bressani was seized as a prisoner near Three Rivers, his Huron friends were massacred. In the band

which committed this outrage were six Hurons and three Wolves (Mohicans) naturalized Iroquois. For half a century the ranks of the Five Nation warriors had been increased and strengthened by their policy of adopting into the league the captive warriors of the native nations.

In the month of September, 1644, Mr. Wm. Kirke, Governor-General of New Holland, delivered Father Bressani, who had been fearfully tortured during his captivity, from the hands of his executioners.

During the month of July (1644) a number of colonists arrived from France, among whom were a company of soldiers, commanded by M. Labarre. The Iroquois were now masters of Canada, but knowing that the chances of war might turn against them, if the new arrivals were well supplied with ammunition, they offered terms of peace, hoping by armistice to check any further relief being sent out from France, and at the same time give the Nations time to quietly prepare for some still more terrible *coup de guerre* against the colonists, the Hurons or Algonkins, and mayhap the triple alliance at one grand coup.

The French gladly made a treaty of peace with their enemies. During the autumn of 1644, twenty-two soldiers joined the Hurons in their descent of the St. Lawrence to trade at Three Rivers, where they arrived the 7th of September, 1645, in company with sixty Huron canoes, charged with peltries. Here a grand and solemn council of all the Nations was assembled, and a general peace proclaimed, at the request of the Iroquois chief. A year rolled on, when the Iroquois, learning that France could or would not send out succour to the colony, again sounded the war-cry and raised the hatchet. The French gathered themselves together in the forts of Montreal, Three Rivers and Quebec, but a few souls, one hundred in all, including men, women and children. This was in the autumn of 1646, at the very time when Father Jogues had, in answer to a request from the Iroquois, left Three Rivers to spend the winter with the Five Nations. The missionary and his servant, Lalande, were both massacred. Later on a list will be given of the names of those massacred by the Iroquois between 1636-1664. Fort Richelieu (Sorel) had lost two men, tomahawked by the marauders, another dangerously wounded. The fort was abandoned for want of soldiers to place on guard, and burned to the ground by the Iroquois. Soon these bands again secretly stationed themselves from Montreal to Quebec and the course of the Ottawa to surprise and seize the Algonkins and French. Father Vimont in Relation of 1645, p. 19, says, "The warfare of the Iroquois was no more like that of France than the warfare of the Parthians was that of the Romans.

To wage battle against the Iroquois was an impossibility. Although of the same race the Hurons were lacking in military spirit and organization, and had no conception of the imminence of their national peril. The firearms with which the French supplied them they had used like children. Individual courage existed among the Algonkin, without the slightest attempt at military cohesion. Even in the hour of success, through sheer thoughtlessness, or lack of purpose, they were apt to lose whatever advantage they had gained—fleeing in their emergency back upon Three Rivers, Sillery or Quebec, followed in swift and terrible pursuit by their enemies.

The military tactics of the Iroquois were well thought out, and organized plans adopted at the war councils of the Five Nations. They concerted together—their union was strength—with one purpose in view the bands fought. And in the hour of defeat, they fled and sheltered themselves from pursuit in the most marvellous manner. Not so the French, who lacked soldiers—the strife was an unequal one and the result self-evident. The French colony, without means of defence, lived under the sombre shadow of the scalping knife of the Iroquois. It is almost inconceivable how the little colony escaped annihilation.

Let us look at another scene:

"Beyond the Neutral Nations," writes Father Ragueneau, who lived with the Hurons living towards the East.

"Near New Holland, there lived the Andastoëronnons, allies of our Hurons, who have the same language. Separated from us in a direct line of 1,600 miles. (Relation, 1648, p, 46).

The Andastes, (north of Pennsylvania), in the beginning of the year 1647, sent an embassy to the Hurons, inviting them to join with them against the Iroquois.

"These people are of the Huron language, and hereditary allies "of our Hurons. They are very warlike, and in one bourgade num- "ber 1,300 warriors."

"The two Andasté envoys, said to the Hurons, "If you are losing "courage and feel yourselves too weak, as against your enemies, we "wish you to know as we have understood that you have enemies, "that you have but to let us know and we will raise the hatchet with "you and whether it be peace or war, support and help you."

Charles Ondaaiondiont, a good and old Christian convert, was sent as a deputy to the Andastes. He left the land of the Hurons the 13th of April, and arrived at his destination in the beginning of June, to solicit the Andastes to intercede with the Iroquois for a general peace, or to continue the war in which they had been engaged for so many years. The Andastes sent one embassy to the Iroquois from four of

their cantons to arrange a peace between them and the Hurons, which the Agniers (Mohawks) were forced to agree to, for it was always these latter who kept up war with all the other nations.

Charlevoix adds: "This offered a grand opportunity for the Hurons to regain the superiority which they at one time held over the Iroquois, an opportunity which they allowed to slip, only asking for a long peace, and because they did not use the best means to re-establish themselves by preparing themselves for eventual war, they fell the victims of the treachery and artifice of their enemies."

Unfortunately the Hurons betrayed the secret and informed the Iroquois of the proposition made them by the Andastes. In return for this confidence the Iroquois promised them peace on land and sea. This is what the Hurons wanted and also what, for the time being, the Iroquois wanted also.

Nicholas Perrot, in speaking of his forty years' experience with the Hurons, in scathing terms remarks upon the utter baseness of the Hurons. Charlevoix also says, "there is every appearance that the Hurons refused the offer of the Andastes, while they amused themselves in negotiating with the Onnontagues (Onondagas). The Agniers (Mohawks) and the Tsonnontonans (Senecas) suddenly fell upon two hunting parties of the bourgades of St. Ignace and utterly destroyed them. For some time after this hostilities ceased.

Charles, whom we left with the Andastes, had occasion to visit New Sweden, and learned that there were no missionaries among the Europeans of these settlements, which were in regular correspondence with the Dutch on the Hudson river. It was while here that he heard of the assassination of Father Jogues, who had some few months previously returned to his mission among the Iroquois. "We judge," reports Father Ragueneau, upon hearing this report, "that the settlement of European allies of the Andastoeronnons, is chiefly composed of Dutch and English, or rather a gathering of many nations, who for special reasons have placed themselves under the protection of the King of Sweden, and they have called this part of the country "New Sweden." Their interpreter told Charles that they were French people. (Relation 1648, pp. 59-60). Charles left the Andastes the 15th August, returning to Ste. Marie of the Hurons the 5th of October, having been pursued by the Tsonnontonans (Senecas).

The first nation to abandon Upper Canada were the Iroquet, the larger number of whom settled near Three Rivers.

The only trade of peltries made at Three Rivers in 1647, was made by the Attikamegues, Tête de Boule of St. Maurice, and some Iroquets, the Hurons did not leave their own country on account of the war.

From 1640 to 1648, the number of colonists arriving in Canada was insignificant, which is explained by the disordered state of affairs at that time in France. The inertia of the One Hundred Associates, and the ravages of the Iroquois, kept up even to the very doors of the various settlements, on the St. Lawrence. M. de Montmagny dismayed by the sad condition of affairs, was recalled in 1648, and M. d'Ailleboust, his successor, possessed neither money nor means to remedy the situation of public affairs. He was replaced in 1657 by M. de Lauzon, who thought little of lightening the miseries and perils of the colonists as long as he could advance his own personal gains.

The affair of the Andastes seems to have decided the Iroquois in making a final attack upon the Hurons. Full of assurance in their own strength they chose the time when news from France spoke but of war with Spain, and revolts at home and butcheries identical with those committed by savage races from time to time in the colony.

On the 4th of July, 1648, the town of St. Joseph, in the country of the Hurons, during the absence of the warriors was attacked, the mission and bourgade were set on fire—Father Antoine Daniel massacred —and his pierced body thrown into the burning chapel.

In the month of July, 1648, the Iroquois blocked Three Rivers, when most opportunely, 250 Hurons guarded by five renowned warriors, with Father Bressani and three Frenchmen arrived upon the scene, and raised the siege. Trade was carried on as usual. In the beginning of August the fifty or sixty Huron canoes returned, with 26 Frenchmen, five priests, a lay brother, three children, nine traders, and eight soldiers on board, besides four persons who joined the party at Montreal (note *Journal des Jesuités*) the greater part of these perished some months later, and without doubt were massacred during the reign of terror which then raged over the lake region. This convoy of 1648 was the last which for six following years reached the western missions.

The departure of M. de Montmagny from Canada marked the end of a regime which had lasted from 1636; but the new order of things was not better than the old, and the colony continued buried under the sad conditions which had been imposed upon it.

The new Government of 1648, according to M. Léon Gérin,* constituted upon the old rule a saving of 19,000 francs, which sum lay at the disposal of the Council. D'Ailleboust was determined to apply this amount to the formation of a company of soldiers, who should be employed to turn out at any moment and from any part of the colony in pursuit of the Iroquois. He gave the command of this flying column to his nephew, Charles d'Ailleboust des Musseaux. It is evident that this measnre was most advantageous for Montreal, which was the most exposed of all the French forts. M de Montmagny had pro-

* Leon Gérin, dans la Science Sociale, Paris, 1891, p. 564.

jected the plan of forming such a flying column, of which the soldiers were to be enrolled as a volunteer militia, who should hold the country and be in readiness to repulse and pursue the enemy as soon as they should be seen approaching the settlements. Lack of means prevented M. de Montmagny from carrying his project into execution. His successor took up the idea and carried it into effect.

Following the regulations of the King, writes Faillon (Historie de la Colonie, II, 96), this flying column had to be composed of forty soldiers, and M. d'Ailleboust, who well understood all the requirements of the situation, added in 1651 another thirty men to the force.

In 1647 a fort had been constructed at Sillery. In 1649 the walls were erected by means of the community's allowance of 19,000 francs, which the King had granted for the benefit of the country. The fugitive western Indians and those of St. Maurice in large numbers found shelter here in 1651.

In the spring of 1649 M. d'Ailleboust sent to Montreal M. des Musseaux, his nephew, in command of 40 men of the flying column to assist the Montrealers to drive back the Iroquois, which was easier to do than to give them battle, for as soon as they heard the sound of the oars of their chaloups, they would flee with such swiftness that it was not an easy matter to catch up to them. This reinforcement encouraged the colonists of Montreal greatly and their confidence in the force was much augmented by the name and qualities of him who was in command. If they had only then been possessed of the experi- which we have at the present time, and the knowledge of to-day (after 1670) of their country, 40 good men well armed and well commanded would have acquired to themselves great glory and rendered signal services to the country, and have held our enemies in fear and check, by the blows which they would have been able to give back ; but we had not then the light which we have to-day, and we were not so skilful in canoeing, the only means used in those days of transport over the difficult navigation of the St. Lawrence which could be used against the savages.

M. Dollier had been a cavalry officer before he entered the priesthood. In 1666 he was appointed chaplain to the attacking troops on the Agnier (Mohawk) Cantons. He was placed in charge of the military department of affairs, but what hopes could he have of success with half a company of soldiers, when in 1649-50, the powerful Iroquois were at their apogee, and the prestige of the renown of their military powers was measured an hundredfold from the deplorable affairs pending in France. A situation, too well understood by the Mohawks, Oneidas, Onondagas, Senecas and Cayugas, in one word, the Iroquois, or Five Nations.

Champlain, fifteen years previously, reduced to moderate his demands for succour to the lowest number of soldiers necessary to keep the enemy in check, and facing a danger which, compared with that of 1649, was but a trifling one, demanded 120 soldiers as indispensable for the protection of the colony, and *certes*, he possessed a coup d'oel which no one of his time could surpass. This was a military question. The two companies Champlain had under his command could have crushed the Iroquois' league in its birth; lacking the foresight to appreciate the crisis in 1649, what were we forced to do? Make a parade of forty infantry, when one thousand men would have been scarcely sufficient to overthrow, that which we had tamely allowed to be built up? That was an undertaking ten times greater than ours was. The 40 men of the flying column were not sufficient to defend Montreal alone, for the enemy came on a war of skirmishing ambuscades, which alike killed our bands of soldiers and colonists, without their attacking the main body of defence—what then remained for Three Rivers or Quebec? Nothing. And the Iroquois, who did not direct all their forces on Montreal, in bands descended the river, a distance of 60 leagues or 180 miles, to harass these lower settlements.

The new governor arrived in Ville Marie in the spring time of 1649, and rejoiced by his presence the hearts of the colonists who were charmed to have among them one of the Associates of Montreal as governor of the colony. The incessant hostilities of the Iroquois did not allow of travel on the river without escort, and, M. d'Ailleboust, in making the voyage from Quebec was accompanied with a body-guard of one dozen of armed soldiers. During the whole of 1648-9, the Iroquois were occupied in harassing, burning and killing the Hurons in their own country, in consequence of which but few predatory incursions were made against Ville Marie, and these M. de Maisonneuve by his prudence and courage easily kept at bay. They lost but one man during that time. M. d'Ailleboust informed M. de Maisonneuve that the Grand Company wished to recognize the good services which Ville Marie had rendered the colony under his government, especially in having increased the garrison by six soldiers, and that instead of the 3,000 francs which had hitherto been allowed him and his garrison, that sum in the future should be increased to 4,000 livres or francs. A little farther on the same author (Faillon) writes, that in 1648 he had learned that the lack of interest which the Associates of Montreal had shown towards this work accounted for M. d'Ailleboust's having turned his prayers for succour to the Grand Company of One Hundred Associates on behalf of the colony in its present distress.

The 16th March, 1649, the Iroquois unexpectedly surprised the missions of St. Louis and St. Ignace in Upper Canada, burning and mas-

sacring all before them. The fathers Brebœuf and Gabriel Lallement died after suffering most terrible tortures. The 17th, Ste. Marie was attacked without result, but on the 25th of May the Hurons abandoned the district, taking refuge on Manitoulin island. About the same time the town of St. John was surprised by the enemy and the Rev. Father Garnier killed.

All bent before the Iroquois; they annexed Upper Canada to their hunting grounds, which yearly added to their aggrandisement. The French had made no defence of this territory. The Iroquois judged that we no longer feared the redskins and they prepared for new fields of conquest.

A party of Hurons escaping from their butcheries took refuge with the Smoking Nations, living towards Goderich, where three months previously three Jesuit fathers had established missions. Others had taken refuge in St. Joseph, in rear of Ste. Marie, where a mission also had been organized during the previous year. Another group, as has been said before, fled to Manitoulin island, where the fathers thought they would remove the headquarters of their missions. They eventually, however, decided upon St. Joseph.

The Cats (Erics) driven back to the centre of the State of Ohio by the Iroquois (1639) now gave refuge to one of the bands of fugitive Hurons, likewise driven from their homes in 1649-50. The following, taken from the Relation of 1660, p. 14, tells the tale how they all perished together. Others took shelter with the Neutrals, thinking to find with them a refuge, as their neutrality among the Nations of North America had up to that time been recognized by the Iroquois. But these traitors, to save themselves, turned against the Smokers of the Pipe of Peace. These latter in turn had to seek shelter from the Algonkins on Lake Superior (west of Lake Huron). Others fled to the forests, others to Andasloé, Virginia, and others joined themselves to the Fire Nation (Mascontins) and the Cat Nation, while a whole town sought shelter with the Senecas, one of the five nations, where they were well treated, living together in a canton, separate from the Iroquois, where the christianized Hurons lived still following the teachings of the new faith.

A note found on page 344 Relation of Father Bressani, tells that the first band of Hurons retired to Manitoulin Island, the second reached the Iroquois, hoping to make terms with them, the third sought asylum on the Island of Mackinac, but followed by the enemy, they retreated to Green Bay and later towards the southwest of Lake Superior. A fourth sought the shelter of the Cats (Eries) in Ohio; the fifth descended to Quebec, lived some years on the Island of Orleans and finally were established at Lorette. The Smoking Nation does not seem

to have suffered great losses in these massacres, but they emigrated towards the Upper Mississippi, where Chouard and Radisson found them in 1660, and father Allouez in 1667.

In the month of August, 1649, a party of about ten soldiers left Three Rivers for the Huron country, with four Jesuit fathers, servants or lay brothers Peter Tourmente, Charles Roger, Peter Oliveau and one named Raison. Towards the 22nd Sept., Father Bressani returned from the missions in Upper Canada, travelling with friendly Indians to Three Rivers. The French were heavily laden with five thousand lbs. of beaver, valued at 26,000 francs, 26 livres. Desforsse's, a soldier with his brother who had been living for the past year with the Hurons, carried for their share 74 lbs. weight, which brought them 4 francs per lb., and the other at 5 livres, 5 sols. The other Frenchmen forming the party of the same expedition were carrying 25,000 lbs. weight of beaver skins, which narrowly escaped capture by the Iroquois, the latter having surprised them a half mile from the Fort, and only after a sharp encounter they reached Three Rivers. Father Bressani and the Hurons returned to Upper Canada in the beginning of October, but they had suddenly to retire at the River des Prairies, north of Montreal, for fear of the Iroquois, these latter in bands infested the shores of the St. Lawrence, says Charlevoix, pillaging and burning houses, and killing the isolated colonists, pressing defiantly even to the very gates of Quebec. They scoured in like manner the districts of St. Maurice and the Ottawa.

Not content with pursuing in the north and west, the remnants of the vanquished and dispersed Huron and Algonkin tribes, the Iroquois engaged in constant hostilities with all the neighboring tribes. Their audacity, and dexterity, and the spirit governing their councils joined to the sad circumstances under which our own government suffered, gave to them for a long period of years the preponderance of authority and terror on all the shores of the St. Lawrence.

The Sokokis savages of the south-west of Maine and New Hampshire in their turn took up arms against the Agniers (Mohawks). During the winter of 1651-52 they had sent a war party against the Andastes but had been repulsed with great loss.

Father Ragueneau, writing from Ste. Marie, of Manitoulin Island, the 13th of March, 1650, says:—"We have at present thirteen "priests in the mission, with four coadjutor brothers, twenty per- "manent servants and eleven others, trained laborers, engaged on time, "six soldiers and four children—in all sixty persons."

The year 1650 brought with it a long series of anxieties and sorrows for Lower Canada, but the troubles which we most dreaded were for the time being averted from us, the Iroquois during this

time being engaged in the annihilation of the Neutral Confederacy and in extending westward conquest.

The autumn of 1650 they gained a first great victory over these people, and in the following spring accomplished a final triumph over the Neutrals. The half of these unfortunates became fugitives, the rest prisoners or killed in combat. The 3rd of August, 1651, the Mere d'Incarnation at Quebec, writes, that these victories of the Iroquois over these people rendered them still more insolent and overbearing.

At this time news arrived at Quebec, that the French had abandoned Upper Canada, and the savages attached to our cause learned that war had again broken out in the south. The 30th of August, she again writes: "A captive who escaped from the Iroquois, reports that the Andoovesteronons (Andastes) warriors and those of the Neutrals had taken two hundred Iroquois captive. If that is true they will be treated in a terrible manner." The Andastes really had raised the hatchet against the Senecas in aiding the Neutrals, later news that reached Quebec 22nd April, 1651, corroborated by the relations of the Jesuits, states that the Iroquois to the number of 1,500, had in turn attacked the Neutrals, and razed a town. Being pursued, the Neutrals in their retreat captured 200 prisoners.

The Five Nations, resolved on supremacy, sent 1,200 warriors against the Neutrals. In 1649 bands of Iroquois having already attacked the territory of St. Maurice, in crossing lake St. Peter by the river Machiche, massacred the Attikamēques and the Algonkins living in their territory. Groups of Nipissing Hurons, people of the Upper Ottawa, arrived via northern watercourses reached Three Rivers for safety from the pursuer. Desolation reigned 300 miles beyond the war camps of the west. The 11th May two men were massacred while working on their farms near Three Rivers and two others near by at the Champlain river. The Mere d'Incarnation relates many of the seizures and captures which occurred during the spring in the neighboring outskirts of Quebec.

June 7th, 1650, Father Bressani, with twenty-five or thirty Frenchmen and as many Indians, embarked to revisit the Huron Missions of Upper Canada, before proceeding very far up the Ottawa river they were forced to return. The unmarried men of the party fled towards the lower river, in the hope of finding boatmen who would take them out of the country. In the beginning of August nine Frenchmen were killed at Three Rivers. The year 1651 presents on its records similar cases. The Hurons fleeing before the hatchets of the enemy were continually seeking colonial protection. "If this little handful of Europeans in Canada, could not present a bolder front than 30,000 Hurons fleeing in defeat before the Iroquois, the inevitable fate remained of their being tortured and burned at the stake in like manner.

No succour could arrive from France, for home authorities at that time were unable to send a sufficient force to resist the Iroquois." (La Mēre d'Incarnation).

The fort of Three Rivers, situated on the high land called the "Platon," which divides the waters was, in 1641, defended by a moat and drawbridge. No palisade, but several cannon. The town stood about 300 ft. to the left on the N. E. plain, which a little lower down is called the "Table" which overlooks the river to the right, rising abruptly to a height of 60 ft. above the town of to-day, which was then laid out in farms. It is said that in 1648 Iroquois prisoners were confined in one of the bastions of the fort, which gives the impression that the fort was a large square building having small turrets or bastions built at the angles which constituted all the fortifications of the place, for the village itself was without a palisade All the plateau of the upper town proper was under cultivation, or at least as well cleared farms, leaving for pasturage the lower town which M. de Montmagny had granted to the habitants as a common. About this date we find recorded nearly one-twentieth part of the land as being held in rights by the colonists. The father James Buteux writes the 21st Sept., 1649: "In the residence of Three Rivers, our constant care and attention are bestowed alike on French and savages. We have no forts but log forts, and no ramparts but those which in a dry season can easily be set fire to." June, 1651, at Three Rivers, Pierre Boucher received a commission as Captain of the village Militia from the Governor-General, carrying with it instructions to divide the inhabitants into detachments for military drill. This may be considered as the first official recognition of the establishing of a Canadian Militia, from which arose the further development of the system by Count de Frontenac in 1673. The 17th March, 1650, the Rev. Mother of the Incarnation wrote: "We are gathering the youth together to send against the Iroquois." It is possible that the young men of Quebec were organized into a militia, but if so, we read nothing further of them.

The marauding Iroquois knew well how to seize our cattle wherever found. The Three Rivers Common enclosed a goodly number in 1648 and a large number of acres of hay on the south of the river at Ste. Angēle. In the spring of 1649, wheat was sent from here to Quebec during the famine. For the past twenty years the colonists had been able to raise for their own consumption, wheat, cattle, pigs, pease, hay, without reckoning Indian corn. "Three quarters of the habitants, by their labor, sustained themselves and their families," writes Mother Incarnation, 1st Sept., 1652.

It is quite evident that Montreal was not taken into account, for here the proportion was much less. Supplies from France are this

season "absolutely necessary at Three Rivers, for, to tell the truth this post has been so far sustained in the most miraculous manner." The 25th Oct., 1651, the Iroquois killed 25 Attikamègues on the river St. Maurice.

It was now six years since the colony of Montreal had been enclosed by walls, and kept alive by provisions brought from France, when in 1648-49 it was decided to clear the surrounding forest, as had been done at Quebec, Sillery, Port Neuf and at Three Rivers. The Associates of Montreal had just been newly re-organized at Paris. In 1651 the colonists were able to raise crops of wheat in spite of the incessant harassments of the Iroquois. Terrified by their enemies, the Algonkins had withdrawn from the place, thus diminishing the defence of the town by their absence. Still, always filled with hope and faith that God was their protector, the little settlement waited for brighter days. The men who composed the first recruits of Montreal were not hardy men. Much progress in agriculture during the first few years was very slow. In 1646, according to Dollier de Casson, all supplies were still furnished from France. Sister Morin informs us that "all the colonists remained eleven years within the fort," living together as a community. During this time and for several years previously in the neighborhood of Quebec, the settlers from Perche a province of France, had established themselves in the outlying places. These people were all cultivators of the soil, settlers from habit and true habitants of the Fort. We must ever bear in mind that the colonists of Montreal were always exposed on all sides to the attack of the Iroquois and this explains the reason without doubt in a great measure for the long inaction of the colonists. Maisonneuve, D'Aillebоust, Closse, were all military chiefs. Maisonneuve had entered the army at the age of 13, and made it his life profession. D'Aiellebоust was an experienced military engineer. Both of these men were eminetly fitted to conduct military organizations in the early colonies and for these very reasons we can preceive that they were all the less likely to become practical agriculturalists. The Jesuits, like the society of Montreal, had at the beginning powerful and generous patrons, the Duke de Ventadour, the Marquis de Gamache, the Commander Sillery also the Duchess D'Aiguillon, interested themselves in the work of Jesuit missions and their first relations inform us of the great number of personages who favoured their missions in North America. Time, however, brought with it the death and lukewarmness of many of their patrons and the work demanded constant support.

The work of Montreal had a very good reason for not counting on the support of the Quebec government. Quebec looked unkindly

upon Montreal for the latter had been established as a settlement with a good deal of *eclat*, and from its inception had affirmed its independence of Quebec. This fact generated a considerable amount of jealousy between the two towns. Quebec could not forget the proud attitude of the rulers of Montreal who would not acknowledge any authority from Quebec, and when necessity constrained and Ville Marie was forced to assist Quebec, it was with bitterness of spirit that assistance was received. In 1651 the Sister Bourgeois wrote that Montreal numbered but 17 men capable of carrying arms against the Iroquois The Superior of the Jesuits calculated that there remained. "in all but a population of fifty in Montreal." Seeing the gravity of the situation M. de Maisonneuve left for France to obtain relief leaving M. de Ailleboust des Musseaux to command during his absence assisted by Major Lambert Closse. It was during the year 1651 that the five or six farm houses outside of the walls were abandoned, the colonists taking refuge again within the fort.

Quebec was still but a village, the thirty residences of which were perched together on the sides of the heights, the upper town and its environs.

It would be impossible to tell how many habitations Three Rivers had but there were 28 families making a population of 100 souls.

All Canada held but 600 French, men women and children. What was sorely needed was a military force sufficient to protect the tillers of the ground and the traders of the rivers and forests. For Upper Canada was lost for commerce and trade, and St. Maurice and the Saguenay had fallen into the hands of the Iroquois.

The gentlemen of the Company of Habitants, strangely blinded to a situation which was of as great importance to the interests of the association as to the interests of the colony, won but little admiration from the line of conduct which they pursued, as may be learned from the following circumstance related by Aubert de la Chènaye in 1676.

"It was not difficult for them to obtain large credits at Rochelle, "for loans were raised in the name of the community, although that "consisted but of six families (forming the so-called Company of "Habitants). And these poor people found themselves enriching the "company at their cost, and yet this very management was ruining the "credit of the company." After some few years' possession they determined not to pay Rochelle, which had made complaints to Paris, and after much solicitation a syndicate was formed to raise means in the name of the Community for the large sums still due the city of Rochelle. The Governor and the families made counter-complaints of mismanagement to the King, who appointed to the board of managers personages of the highest standing to take into their consideration the affairs of

the colony. These were M. de Moranges, M. de la Marquerie, Verthamont and Chareur, and later on M. Lamoignon, de Boucherat and de Lauzon. The latter, also on the board of managers, offered to visit the country and there arrange as far as possible existing difficulties. He sailed from Rochelle. He was a man of letters.

John de Lauzon does not figure in the first list of the One Hundred Associates of 1627, but he was none the less most active in the establishment of the company in the country; he continued an active member until 1663. In truth, he was the mainspring of the company during thirty-six years, which was recognized in his bringing with him upon his coming out to Canada the appointment to a seat in the Administration, which he held from 1651 to 1657, during which time the Bureau at Paris was very little troubled.

The three years' government of M. d'Ailleboust would expire in the autumn of 1651. The Company of One Hundred Associates held a meeting in Paris at the residence of Sieur Cheffault, his secretary. The 2nd Jan., 1651, the names of Jean de Lauzon, Duplessis-Kerbodeau Bécancour were presented to the King from which the King should appoint the new governor for the coming three years; M. de Lauzon received the appointment.

The 14th Oct. M. de Lauzon arrived at Quebec, with M. Duplessis-Kerbodeau as governor of Three Rivers. The salary of the latter had been raised to 5,250 livres. It seems as if Robineau had made the voyage at the same time. These traders worked harmoniously together. To make up the increase given to M. Duplessis, M. Maisonneuve's annual allowance was rebated 1,000 francs for himself and his garrison, his total annually now being but 3,000 francs. The Governor-General obtained for himself a supplementary sum of 2,000 livres without any additional tax than that of supplying the garrison of Quebec with three soldiers. The 9th November M. de Maisonneuve left for France.

The arrival of de Lauzon in 1651 inaugurated miseries and humiliations for Ville Marie. The first act of the new governor was to withdraw the 1,000 livres from Maisonneuve which D'Ailleboust had accorded him.

"At Quebec," bitterly remarks M. Faillon, "the government granted pensions to the jesuits, to the hospitaliers, the fabrique of the parish, to the surgeon, baker, and to many others, and there remained for Ville Marie but 3,000 livres to the governor for his garrison and 1,000 livres for the caretaker of the Company of Habitants."

Affairs in Paris were in a deplorable condition. The civil war still rent the country. The declaration of the peace of Rueil in 1649, had terminated the old conflict of the Fronde parliament, but disputes were renewed in new forms. Mlle. de Montpensier and the Prince of Condé

declared themselves as against the Court, while Turenne turned his back upon the malcontents and placed his services to the Court which he had formerly defied.

On the 13th Sept., 1648, the Queen, Mazarin and the young King (then nine years of age) had left Paris for St. Germain. Some time after they returned to the Capital, and the following 6th of Jan. they were forced to seek again the shelter of St. Germain.

It was after this that the Princes of Condé, de Conti and de Longueville were arrested and thrown into prison. When Her Highness the Princess Royal of France placed herself at the head of the Gentlemen of the Fronde against the Court faction, Condé was soon liberated and took up arms. It was now that Mazarin, in order to regain the confidence of the people in the governing power, took upon himself the blame for having brought on the national crisis, retired from the Cabinet and took up his residence at Cologne. Such was the unfortunate political condition of affairs at Paris when M. de Maisonneuve arrived in France from Canada. The Court was in exile at St. Germain. The majority of the young King was proclaimed the 7th Sept., 1651. Condé defeated by Turenne within the walls of Paris—the latter re-entered the city in triumph, having his adversary on his heels (2nd July, 1652). The Royal Princess, after many plots and counter plots in vain endeavors to assist Condé, was obliged to retire to her own domains. Mazarin was recalled to power (3rd Feb., 1653), before all was amicably arranged, but the civil war was not really terminated until the end of the year (1653). This news from France to Canada had a paralyzing effect upon the courage of the colonists. The Iroquois, aware of all that was going on in Europe, redoubled their confidence and ardour. The Mother of the Incarnation in Sept. 1652, writes that no assistance from France can be expected. The year 1652 brought with it to Canada sorrowful and sinister shadows. Dangers had increased on every side, for the Iroquois kept well informed of the European news, with increased confidence redoubled their schemes and aggressions, knowing full well how feeble any assistance from the mother country would likely be if sent to the colony. Canada now seemed to the colonist on the verge of an abyss, over which everyone saw himself or herself ready to be plunged at any moment by the Iroquois. News received from various sources all pointed towards Three Rivers as the central point of attack of the enemy. It appeared as if the flying column would have to be garrisoned there during the winter of 1651-52, or that they were sent there in the early spring. During the first days of March, M. de Lauzon, Grand Senechal, accompanied by René Robineau and 15 soldiers, visited Three Rivers. Already the enemy had begun their ravages in the neighborhood. In speaking of M. de Lauzon's traits the following circumstance speaks for itself

He had promised M. de Maisonneuve ten soldiers, for whom he had sent on in advance the accoutrements. In the (autumn of 1652) he sent ten men in an open boat to Montreal, insufficiently clad for the time of the year or provisioned for the trip, who upon their arrival looked, from starvation and cold, more like living skeletons than human beings. How shattered! two of the number were children and were cared for. One was called St. Ange and the other boy called himself La Chapelle. These poor soldiers were not long at Montreal before every care was bestowed upon them, in feeding them well and comfortably clothing them. They were soon in a good condition to aid in our endeavors against the Iroquois. Montreal hoped nothing good from the new Governor-General, and this explains the trip of M. de Maisonneuve to France.

In 1652 M. de Lauzon was made Governor in place of M. d'Alilleboust He persecuted Lemoine and withdrew 1,000 livres from M. de Maisonneuve which the company had granted him, for which he was thereby sufficiently punished in that the Iroquois, in this year, took the rest of the refugee Hurons on the Island of Orleans and killed his eldest son and servant members of the household of M. de Lauzon within view of the people of Quebec. Montreal was in great peril.

In 1652 Lauzon disbanded the flying column, thus depriving Montreal of the assistance which M. d'Ailleboust had granted to the island. Later on he tried, (but without succeeding), to impose a tax on all merchandise passing Quebec *en route* to Montreal.

The 7th of July, 1652, at Three Rivers, Major Lambert Closse, of the garrison of Montreal and M. des Mazures, officer of the flying column, were present at the ceremony of a contract of marriage.

In an Act of d'Ameau, dated 5th August, 1632, Three Rivers, we read "William Guillemot, Esq., sieur Duplessis Kerbodot, captain of the flying column, governor of the fort and habitation of Three Rivers, appointed by M. de Lauzon, bought lands on this occasion."

At the naval engagement of canoes at Three Rivers, the following 19th of August, were killed or taken into captivity by the Iroquois, M. Duplessis-Kerbodeau, soldiers Manuel Langoulmois, Lapalne, Lagrave, Saint Germain and Chaillon.

In October, 1652, Major Closse marched against the Iroquois with twenty-four men of Montreal, which seems to have been the number of men capable of carrying arms in that town. M. de Maisonneuve in writing from France said that one hundred armed men were necessary to maintain the French colony at Montreal.

The 4th November, 1652, Nicholas Rivard, Captain of the Militia at Cap la Madeleine, sold land to Gilles Trottier. He held the same position the preceding year.

About the middle of December, 1652, the Iroquois captured two Hurons near Three Rivers. They also constructed a fort nine miles distant, in the depths of the forest, to the west of the village, in order to station themselves so that they could cut off hunting parties in the neighborhood during the winter. Such tactics were a new departure on the part of the Iroquois in Lower Canada. The French fortified the fort of Three Rivers to the utmost of their power, which was well guarded during the winter, but as soon as the river broke up in the spring of 1653, bands of marauders reappeared, seizing hunters and all travellers passing through the country. The fur trader suffered severely from the evil influences of all these wars. In 1653 the trade at Three Rivers was so small that all resources were applied to the fortifying of the place. The beaver, the chief article of commere, was most scarce—not a single skin had been brought to Montreal that year, although the yield had been very abundant, all of which had been directed by the Iroquois to New Holland (Albany).

On the north shore of the St. Lawrence the French attempted to open up trade with the natives, but found the Iroquois already in advance of them at the sources of the St. Maurice and the Saguenay, and soon found them terrorizing all the ports of the north country, comprising Tadousac. M. de Lauzon, seeing that all the trade of Upper Canada and of St. Maurice brought in so small returns, formed a company of merchants of Quebec to undertake the trade of the Saguenay, of which district the Company of Habitants had possessed the monopoly for the past four or five years. These "Habitants" were accused of having a deficit of more than half a million of francs. M. Aubert de la Chênaye, quoted above, very strongly condemns their conduct.

Fifty Frenchmen (farmers no doubt), whom M. de Lauzon had enrolled to make up a flying column, left Sillery the 2nd July, 1653, under the command of Eustace Lambert, with the intention of sailing up the river to check the Iroquois, who in bands had been over-running the country. The plan of the Iroquois was to blockade Three Rivers, for this reason they marched in numbers of several hundreds, which appeared in conjunction by land and water, cutting off all communication between the different French settlements. One of these bands near Quebec, seized the Jesuit Father Poncet, of whom they served themselves as an envoy of peace. The humiliating defeat which they had sustained on the 22nd August at the assault of Three Rivers, where Pierre Boucher commanded, prompted them to follow their old ruse of asking for peace. The French, unable to do otherwise, consented to the proposal. Prisoners were exchanged, and the autumn saw joy and tranquility reigning over the land. Understanding well the unstable-

ness of this surprising calm and cessation from hostilities, the colonists hoped that if an outbreak did occur, ere that time reinforcements surely would reach them from France. This truce lasted thirty months, and was marked only by isolated attacks upon the French country by the Iroquois, whose principal forces, during this time, were engaged in war with other neighbouring nations to the east and south of their country. We must remember that ere this time the Iroquois had conquered Upper Canada, later on they successfully undertook the conquest of the west. All this success because we (the French) had so few troops on our side to protect our own farmers, and at the same time engage against the Iroquois.

So much for a eulogy on this incapable regime!

September, 1653. The jubilee procession took place at Quebec, where prayers were offered heaven for the safe return of M. de Massonneuve with the reinforcements which he had been promised in France. The Journal of the Jésuites Notes, "The Iroquois witnessed the procession, in which parade there were more than 400 fusiliers in fine marching order." Another authority writes, "They saw marching in good order 400 mousquetaires well armed, which alarmed the Iroquois looking on at the sight."

The Abbe Faillon also comments:

"We have to suppose that the large number of these armed men were Indians from Sillery or the Isle of Orleans, and that these 400 mousquetaires were not capable of inspiring great terror, for the 100 whom M. de Maisonneuve brought into the country were regarded as, and were in effect, the saviours of the country."

From 1648 to 1652 clearings were made for farms, and in 1653 Ville Marie at last gave the appearance of a regular colony or settlement. It was in this year ('53) that Maisonneuve brought from France 100 colonists, recruits principally from Maine and Anjou. A large number of whom had grants of land conceded to them and with the assistance which they received from the Society of Notre Dame of Montreal, they set to work to establish themselves thereon.

According to the Ven. Mother, there were in 1653 more than 2,000 Frenchmen in the colony, but other calculations show a reading of not more than 675 souls as the population; but if we add the floating or itinerant census we might say there were 900 souls. She ought to have written "near a thousand" and the copyists have read "more than two thousand." M. l'Abbe Ferland, giving the total as two thousand, says, "Even that would not have been a great number for a colony in existence for 45 years, while that of New England (follow-Josselyn) numbered 100,000 souls a few years later. According to the MSS. of the Sister Bourgeois, quoted by M. l'Abbe Faillon, there were

but five or six houses in the upper town of Quebec and some stores or warehouses in the lower town. The Sisters doubtless were speaking only of the vicinity of the Ursulines or the Hôtel Dieu, and continues in enumerating Cap Rouge, Sillery, the Côte Ste. Germain, Notre Dame des Anges, Longue Pointe, Chateau Richer, Beauport, l'Ange Gardien, Cap Tourmente, Côte de Lauzon, all of which places were inhabited and were outside of the town of Quebec. Our calculations give 675 souls for the fixed French population in Canada in the summer of 1635, viz.:

400 for Quebec and environment.
175 for Three Rivers and Cape Madelaine.
100 for Montreal.

Total.. 675

At the end of September of this year M. de Maisonneuve brought the contingent of 100 men the larger number of which were artizans, but not soldiers or farmers, but this did not prevent M. Dollier and after him others, to prepare and drill them as recruits in the defence of Montreal. It was in this way that they were called a military force. The truth is, that from 1657 they had been obliged to take up arms against the Iroquois, who had again become dangerous, and from forty to fifty of these brave men perished in combat during the following year.

The reader of this paper can see after a perusal of these pages what kind of colony the pompous Company of One Hundred Associates with Richelieu at their head had projected and carried out, to justify authors in finding all things admirable in Canada during the "Heroic Age," when the bad faith of governors and governments exhausted the loyalty, patience, industry and indomitable courage of the colonists of La Nouvelle France.

NOTES ON SOME MEXICAN RELICS.

By Mrs. Wm. Stuart.*

*Mrs. Stuart, during her residence in San Geronimo, Oaxaca, in the Tehuantepec Isthmus, Mexico, has directed some attention to the archæology of the country, and has succeeded in bringing together a collection of interesting specimens, which it is her intention to present to the Museum.

The writer supplied with her notes a large number of admirably drawn pencil pictures of her best material, but unfortunately these could not be satisfactorily photographed for engraving purposes, and greatly reduced copies of only a few are here reproduced in one half diameter.

San Geroñimo, a village of some 3,000 inhabitants, lies near the south of the Isthmus of Tehuantepec, in the republic of Mexico, and is situated on the line of railway which runs across the Isthmus from Coatzacoalcos to Salina Cruz. It is within the state of Oaxaca; the border of the sister state of Chiapas, being about 100 miles distant, to the south-east. A small river supplies water to the village for all purposes. Lofty mountainous ridges some 30 miles away, show very decided traces of volcanic action,—in the distance, yet high above those to the south-west, towers Eucanto, one of the ancient mountain "Cities of Refuge." Certainly its bold outlines convey the idea of a secure stronghold, and thither did the Zapotecs repair in times of invasion by their enemies. On the sloping ridge of the hill of Ixtaltepec, or "the white mountain," about four kilometres south-east of San Geroñimo, are perched two huge boulders, which have evidently been dislodged from somewhere near the summit. These stand on end, and are supported by each other.

The ancient people, so quick to take advantage of every quirk of Mother Nature, saw in these boulders a fit and lasting monument on which to portray in their famous, indelible, dull red paint, certain strange drawings of hieroglyphical import—iguanas, and rabbits' heads, with various numbers of discs following, and innumerable other signs and symbols. It is said that certain American explorers have visited these rocks, and photographed the symbols, but no one here seems to know what was the outcome.

Among the low range of hills which lie to the east of San Geroñimo, at a place called Puente, and about four kilometres from the village, another series of these rock paintings is to be found, which are quite as interesting as those of Ixtaltepec mountain. These are not generally known, and therefore, it is said, have never been visited by persons of inquiring minds. Further off, notably among the lagunas, near Chuichitan, some twelve miles away to the south-east, are other rock paintings, and, it is said, sculptures well worth seeing.

Besides the "carreta" or cart-road running between San Geroñimo and Chuichitan, and some three kilometres to the north-east, is an ancient mound some thirty feet high, with a circumference of about 120 feet, roughly speaking. There seem to be no traces of mortar about the mound, but many good specimens of ancient idols have been picked up there, and much broken pottery lies around.

The natives of this region are not, as a rule, tall, and in fact appear short and slight when standing beside most of the "Gringos," who come down here, (the people of Ixtaltepec alone excepted,) as they are noted for their general large size. Many of the women have beautiful features and a queenly carriage. Some, when well dressed, convey the idea of a Cleopatra or a Queen of Sheba.

The native language here is Zapoteca; (very likely much corrupted), but Mexican-Spanish is also generally well understood and spoken. Some town-lands are more loyal than others to their ancient tongue, and preserve solely a variety of Zapoteca as their common language, which is notably instanced in the case of the town-lands of Barrio and Petapa, lying beside each other to the north-east of San Geroñimo, and near the Tehuantepec railway. In Petapa all the natives speak a strange dialect (?) of Zapoteca, which has a very drawling yet pleasing intonation, quite different from that spoken in the Tehuantepec region, and they use many words differing totally from those which signify the same thing in Zapoteca as spoken elsewhere, and very few understand Mexican-Spanish at all; whereas, in Barrio, their neighbors commonly speak Mexican-Spanish, and are often nonplussed when in conversation with a native of Petapa.

San Geroñimo has been visited occasionally by the vendor or collector of antiquities, who, establishing himself for a few days at the principal fonda or hostelry of the village, gives notice to the various tiendas (shops) that he is there to collect all sorts of pottery of ancient make found in the earth or river: copper or stone axes, and every kind of "antigua" the people can bring in, including coins of all sorts not current at the present day. In this way, several large cases of antique figures of idols, ollas,* etc., have been removed from this village and its vicinity, so that now it is very hard to find here the best class of such article—at least in the houses—though without doubt a vast quantity of these things lies imbedded where the village stands.

During over two years' residence, I have failed to discover, or even hear of, a single case of a "fake-dealer" or of a spurious specimen of any description whatever.

The natives do not, as a rule, value their specimens at all, until they hear there is "money in them," when their cupidity is aroused, and they will try to make a bargain, though on an absurd principle; a

* Prononuced *awyas* or *owyas*.

roughly made and broken olla, if it is only large, appealing more to their ignorant minds for a high price, than a small and perfect specimen does.

In the neighboring districts, many valuable specimens have been found during the past ten years, notably two small gold images, which I am told have been forwarded to the United States, and one small gold idol head, weighing one ounce, which was found some years ago at the foot of the hill of Ixtaltepec, and presented by the finder, Count Henri de Gyves, a citizen of San Geroñimo, to the President of the Republic of Mexico Count Henri also informs me that he had the good fortune to be the possessor many years ago of a beautiful little olla, which was found in this neighborhood, and which he believes was made of chalcedony, with a cameo-like head carved on one side of it. This he sen to France for presentation to M. Emile Zola.

In my own collection here may be noticed a most rare and beautiful olla, made out of a solid block of white quartz, which is very heavy It measures 5½ inches across the mouth, and about 7¼ inches across the bowl or body. See description following. I have been fortunate enough also to procure a little image of a very hard, pale green, polished marble, perfect and well finished. A little image cut out of white quartz, and several articles made from a beautiful pale green marble-like stone have been found around this place.

As it is thought that some of the specimens enumerated in the following list may be included in the valuable varieties of jade or jadeite, it may not be out of place to insert here a portion of a letter from Mr. Edward (well known in Mexico City) to the *Mexican Herald* of Sep. 24th, 1899, on the subject of a supposed jade pumpkin, which is in the Museo Nacional of Mexico city. He says, "We do not know whether the word 'chalchiuhtl,' which the Spainards translated by 'piedras verdas' referred to emeralds only, or to emeralds and objects in jade or jadeite. The latter (jadeite) is the term which men of science apply to one especial variety of Mexican jade, of a light greyish-green, very translucent, mottled, with patches of a deep, leek hue. This is harder than other varieties of jade, and takes a far more brilliant polish. No one but a jeweller can tell what is jade and what is not, for the jades of commerce are by no means confined to the nephrites of mineralogy. Therefore, no one in Mexico connected with archæology can say authoritatively whether this enormous mass (the pumpkin) would be recognized by the trade as a genuine jade. French lapidaries have for a long time enjoyed a monopoly of jade cutting, for the Orientals will not sacrifice any portion of a material so valuable and therefore the object carved depends entirely upon the shape of the nodule. The result is, that an oriental collection of carved jade pre-

sents objects so fantastic that their meaning cannot be recognized, and the beauty of the material is all but lost."

A great variety of other finds are mentioned in the following list—some very crude and others daintily worked and finished, but each valued as revealing the necessities and inventive genius of those who used them.

Four odd looking specimens (one of which is here figured) from four to five inches long, were presented to me by Mr. F. Wehner, of Tehuantepec, who procured them from near Union Hidalgo, a village about 20 miles from San Geroñimo, in 1897. They are probably made of an alloy of copper and tin, and are occasionally used by the natives who work with hides for the purpose of scraping the skins, though there is much evidence that for such purpose they were not originally intended.

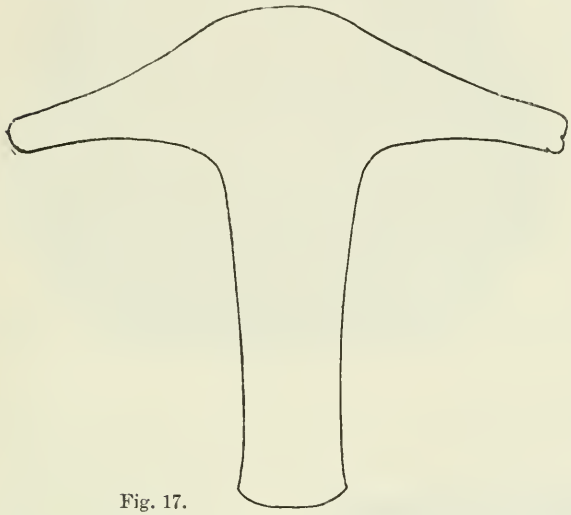


Fig. 17.

In J. Carson Brevoort's book on "Early Spanish and Portugese Coinage in America," he notices on page 5, Cogulludo's "History of Yucatan," published 1688, page 181, where reference is made to money used anciently by the natives, and along with cacao beans, bells, and hawk bells of copper, colored conch shells from other countries, and precious stones and gold dust, are mentioned "small copper hatchets coming from Mexico," as forming articles of exchange. Plate I. in Brevoort's book gives a good illustration of one of these.

He further adds: "These last were probably like the one figured in Dupaix's 'Antiquites Mexicanes,' Plate XXVI., No. 74, which is formed like a shoemaker's cutter, and served as a skin scraper. See also Herrera I. V. 5."

Brevoort further adds, on page 5, that Humboldt in his "Essai Politique sur le Royaume de la Nouvelle Espagne" states that pieces of copper in the form of the letter T were used as currency in some provinces.

Mr. W. H. Holmes in his "Archæological Studies, Part II., Monuments of Chiapas and Valley of Mexico," page 287, gives an excellent account of these articles. He says:

"Among the most characteristic of the Mitlan art remains are certain hatchet or tau-shaped objects of hammered copper found in very considerable numbers in graves, and possibly also in hoards or caches. Measured with the stem they vary from 4 to 7 inches in length, and the width across the blade is about the same, As the blades do not exceed one-tenth of an inch in thickness in any part, it is apparent that they could not have been employed as hatchets or chisels, although, set in handles, they would perhaps have served a good purpose as trowels, knives or scrapers. The generally accepted theory of their use is that they were the money of the ancients, or at least served as a standard of value. It may be remarked that the shape and tenuity suggest the possibility of their use as ornaments, and it appears that if well polished and set as a crowning feature in a helmet or head dress, they would prove very effective. Possibly, however, they were symbols, and served some religious purpose."

About four miles from San Geroñimo a native found several of these objects buried in the earth, in which they had been laid in something of a star-like form, the cross ends meeting in the centre, and the points outwards.

Mrs. N. P. Bell, San Geroñimo, has a broken off shank (?) of a very large specimen of these strange articles. It measures $1\frac{5}{8}$ inches across the base.

This rare and beantiful specimen (figure 18) was dug up near Union Hidalgo, some twenty miles from San Geroñimo, and was procured and presented by Mr. F. Wehner. It appears to have been cut out of a solid block of white quartz. The portion of the lip (from which the piece was broken when given me) shows the sparkling quartz to perfection, while the earth from which it was turned up has left a lasting remembrance of itself in toning the inside and outside of the jar to a light yellowish hue. The outside is slightly rough-

Fig. 18.

ened, but not sufficiently so to spoil the beauty of the specimen. It is provided with three short feet.

A very good and perfect olla is represented by figure 19, in dark, well-burnt clay, with rather regular pattern marking. Each double set of these is repeated on both bands, which go all round the olla. Locality — San Geroñimo. Lent by Mrs. N. P. Bell.

Fig. 19.

A small, neat olla, (figure 20), is remarkably perfect, with two small handles; these do not come opposite each other. It is of a blackish gray color, and came from Chuichitan.

This mask (fig. 21) of a woman's face (called by the natives "a queen") seems to be made of baked clay. It is now quite black and well preserved, and is really well executed. It was procured at Chuichitan from a native who said it had been found buried in the earth, about 1894. It is the only specimen of the kind I have seen here.

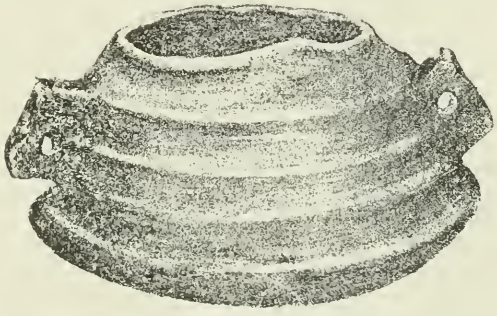


Fig. 20.

In my collection are six varieties of what may be termed seals or stamps. Three of them are roughly made; and are not remarkable, but the others are very fine. All were found in the neighborhood of San Geronimo. They are made of more or less finely baked clay, and are of a whitish color.

A somewhat unusual specimen has come into my possession, namely, a small block of dark, well-polished stone, one side being

highly ornamented with numerous, though inartistically arranged, rings, cut into the hard stone by a tubular drill, possibly a bird's bone; the little raised centres of each ring are plainly seen. The reverse side has very firmly cut lines running rather obliquely from end to end; though doubtless intended at first to be perpendicular. The four narrow sides are deeply grooved at each corner only. This specimen I have seen in only two varieties, the first being the one above described: the other has single lines on one side, while the reverse is devoid of all ornamentation, and the stone unpolished, the sides still showing the deep grooves at the corners. From this it would appear that they were probably used as amulets, or, as some suggest, as plummets, for all come in the same size, and vary but slightly in weight.

Fig. 21.

In my collection are a stone hammer and a stone axe, both picked up on the surface here by myself, about a mile out of the village. The stone hammer is notched at both sides of the narrower end, while the periphery is considerably worn. The stone axe is remarkably similar to that shown on p. 50 of Mr. Boyle's Archæological Report for 1896-97; in fact the pointed end is identical, and has not required the hand of man to shape it for its purpose. In this specimen the groove is deeply and firmly cut, and a rounded socket has been cut out of the remaining portion of the stone.

Among my ollitas, one is unique, made of reddish, well-baked clay, and carefully, though not symmetrically, worked. Three tusks hanging out of the mouth may indicate Tlaloc or some other rain-god. This comes from Chuichitan. One is of white baked clay. It is a small, squarish mouth and six suspension holes, one in each ear and two on each side; this is from San Geroñimo. A third is made of reddish clay, but now very brown from long contact with mother earth. It is unfortunately much broken, and a portion of it is missing. Still enough remains to show it was well executed, and it shows every trace of antiquity. This was found by my little daughter in a neighboring "milpa," or cattle-field, where only the small, round, raised handle appeared above ground.

I have two very carefully made and rare little images. One is of white quartz, but is pretty well browned by its sojourn in the ground, from which it was taken about 1895, near Tehuantepec. It has one pair of bi-conical perforations in the middle of the back, which, with its many deep and clean cut grooves (notably those around the neck and feet) would indicate that the image was intended for suspension as a pendant ornament. The other is made of a pale green, marble-like stone, possibly onxy, with highly polished surface, and worked with much precision and skill. It has two pairs of bi-conical perforations, connecting the sides with the back. These come about the middle of the image and point to its purpose as an amulet.

Among other amulets, one is of very hard, dark baked clay from Chuichitan. It seems likely that the legs and arms were formerly joined together. A second is a beautiful specimen of some pale green and gray stone, which sparkles considerably when turned about. Though formed like a little adze or chisel, it was likely used only as an ornament. Another was evidently also intended as an ornament, a perforation at the top of the forehead having been commenced, but not completed. It is of baked clay, hard, black and shining. A fourth has only his head to show, with one pair of bi-conical perforations at the back of the neck, showing its use as a pendant. It is made of a marble of sage green shade, and well polished. I cannot trace the history of this specimen, but I am told that others like it are found in and near Oaxaca City and Mitla. One gentleman in Tehuantepec has five in his possession. What appears to be a child's rattle, contains a small stone. It is made of white baked clay. And I have a pendant with two suspension holes—it is of baked clay, quite black and shining.

A variety of small articles includes what appears to be a necklace bead of brown baked clay; an odd-shaped necklace bead made of blue-green marble-like stone, highly polished, and showing distinct indication inside that the perforation was worked with a tubular drill; half of a necklace bead, which I only mention, as we have never found anything else of the same material here—is made of some soft polished stone of pale green color; two that appear at first sight to be beads, but are more likely spindle whorls, one being of a reddish color, very neatly shaped, and quite smooth, while the other is of clay burned a dark brown and apparently mixed with granite or other stone; twin specimens, found together in the ground near Ixtaltepec, about five miles from San Geronimo, both apparently had belonged to the same string of necklace beads. They seem to be formed out of a stalactite or some such material, are hollow throughout, and of a whitish color, with little raised incrustations scattered over the surface, and two slight grooves (evidently for ornamentation) at each end. I have also

numerous small articles, specimens of which are very plentiful; they are made of reddish-brown, poorly baked clay, and as a rule rudely fashioned; among some seventy, only four or five being neatly moulded They vary much in size, with only two variations from the usually smooth surface. These are described below. Professor Frederick Starr, of the University of Chicago, writing on "Little Pottery Objects of Lake Chapala," calls the similar specimens found in that lake "sinkers." It may be that these were so used by fishermen in some localities. Those in my collection were all found on the surface of dry ground, at distances anywhere between 50 yards and 4 miles from the river. Professor Starr further adds that they are quite like the beads described by Thurston, and figured at page 320, in his "Antiquities of Tennessee," but are not perforated. I am reliably informed that near Tapana on the south coast of Oaxaca, a number of beads in shape like these clay objects, but made of bronze and perforated, were found in a grave along with a portion of the string which bound them together, which however literally crumbled to dust when handled. Some people here are of opinion that they were strung together in graduating sizes, with two strings, thus, with the largest in the centre, forming a necklace. I have successfully strung mine together in this way, but personally incline to the third opinion as to their use, which is, that they may have been used in some game, to slip along strings, or in some other way, for gambling purposes—the two varieties mentioned above having somewhat the appearance of dice, one variety being marked with a little indented ring in the centre of each concave end, while the second variety has five little indented circles round a centre circle on one concave side.

Among the many pieces of obsidian knives found in this neighborhood, I have been unable to procure a perfect knife, the longest specimen measuring only about two and a half inches in length, although many of the shorter pieces show remarkably sharp and unbroken edges and points. Some of the flakes are about an inch and a half square, and about a fourth of an inch thick. Mr. W. Holmes, in his "Ancient Cities of Mexico," part II, p. 287, says: "I did not see a single well-shaped arrow-point while in the valley of the Rio Mitla. Finely made flaked blades and specialized points are occasionally found, however, in the Oaxacan region."

Obsidian arrow-heads found here seem much smaller than the flint arrow heads from the Six Nation Reserve, Ontario, illustrated on p. 49 of Mr. Boyle's Archæological Report for Ontario of 1896-7, and which he states "are of convenient size for arrows, but their purpose may have been that of adornment about the person."

I have a beautiful specimen of a flint (?) knife. It is of a red-

brown, autumn-leaf shade, carefully cut and wonderfully perfect, only a very small portion from the extreme tip being broken off, and it shows no signs of ever having been used. This, along with another, was found by a native about 1897, while ploughing his field in the the neighborhood of San Geroñimo.

A very fine and perfect specimen seems to be like a small spear-head, and is made of dull, white flint. In the Archæological Report for Ontario, 1896-7, p. 61, Mr. Boyle shows us a very similar one, and says his specimen "was most likely a scraper or knife." He adds: "What are called 'women's knives' of slate, are in most instances of this form." (It seems a pity that such a carefully-cut specimen should in the end turn out to be only a "woman's knife.") *

This little specimen may have been intended as a small arrow-head or ornament. It is made of slate, and it seems scarcely possible that it is only a flake of slate, which has so happily chosen to break into a pretty leaf shape.

A very small and beautiful hatchet has been made out of a sage green, hard stone, which has streaks of darker sage, and some yellowish markings, and a polished surface. This was found in 1898, in a neighboring "milpa" or fenced-in field, lying on the surface, and near some pottery fragments.

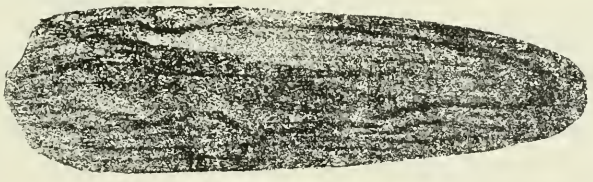


Fig. 22.

A broken end of what seems to have been a hatchet or chisel, is of material which is very unusual; it is a pinky white flint, highly polished, and shows many signs of hard usage.

Two other specimens of different sizes of chisels may be diorite.

Fig. 22 seems to be a chisel. It is made of a light green, hard stone, with some very dark green markings on one side, and on the other are some green and yellow delicately traced lines, reminding one of the outlines of oak knots. (This beautiful specimen is in the private collection of Mrs. N. P. Bell in San Geroñimo, and was kindly lent with some other specimens, for insertion in this sketch of the archæological remains of San Geroñimo and its neighborhood).

* Why is it a pity? and why "*only* a woman's knife?"—D. B.

This strangely shaped article (figure 23) was likely used as a ladle, and the fact of the handle being so deeply grooved and sloping downward so peculiarly, suggests that it may have served as a channel for

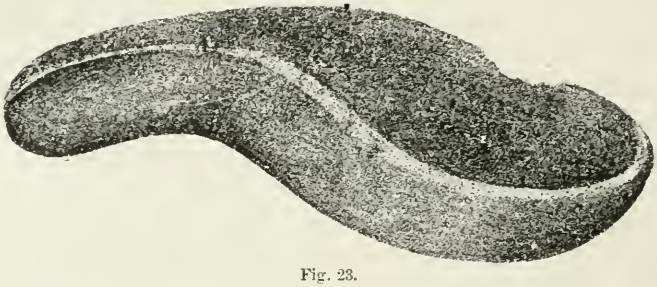
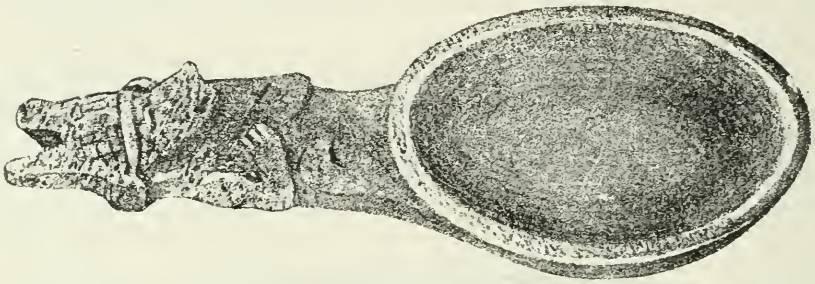
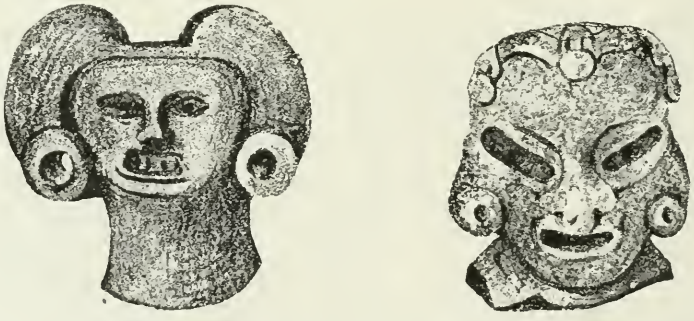


Fig. 23.

carefully running off any fluid contained into the ladle.* It is made of dark, well burt clay. From San Geroñimo. Lent by Mrs N. P. Bell



Here is a unique sort of ladle, which looks also very much as though it might have been intended as a fancy frying-pan, but it shows no signs of ever having been used in any capacity. Almost in the centre of the bowl a small hole has been bored. This article is in white, well burnt clay, and comes from near Juilè on the Tehuantepec railroad. Lent by Mrs. N. P. Bell.

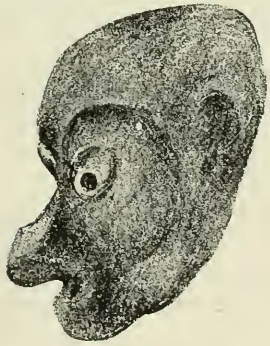


a *b*

These two idol heads are decided contrasts. Fig. *a* is made very smoothly of clay, well burnt and a grayish color This specimen has a

* The shap e is probably a survival from the time when such articles were made from a arge shell. D. B.

peculiarity which distinguishes it from all other heads I have seen, viz., that the ear discs are pierced from side to side, showing a clear well made hole. Fig. *b* is of whitish, well-burnt clay with very distinct outlines and markings.



c

d

e

f

Here we have a variety of strange heads. Figs. *c* and *d* are perhaps intended to represent the head of the king vulture or "Rey de los Zopilotes." Fig. *e*. A monkey's face of dark well burnt clay. It is hollow at the back like a mask. Fig. *f* is an odd, impish looking little head, of well-burnt dark colored clay.

Among other small but interesting objects are what is supposed to be a white stem of white burnt clay, with large mouth piece, but unfortunately the bowl has not been found;* a copper finger ring, found about 1894 in the bank of the river of San Geronimo; a very small specimen of an axe or hatchet and a good specimen of the usual stone axe, both of a very dark, greenish-black stone; a large copper axe or chisel. Three others of the last named kind, two of them much smaller than this one, have been found in this neighborhood.

*Old Mexican pipes had no bowl, they were merely tubes. Mrs. Stuart's "stem" is probably a complete pipe.—D.B.

AN OLD LETTER ABOUT THE ORIGIN OF THE INDIANS.

The following brief notice of the Indians is not devoid of interest as showing among other things the beliefs entertained by many intelligent people not so long ago respecting the origin of the Indians.

The "Creation" and "Indian Summer" myths will probably come as novelties to most readers now-a-days.

The notes were in the form of a letter to Mrs. Sydere of Yarmouth, Elgin county, Upper Canada, and were written in 1843 by the Rev. L. C. Kearney, then R.C. clergyman in St. Thomas, Upper Canada.

As was customary until within a comparatively recent time, the reverend gentleman is quite indefinite when he refers to the beliefs of "*some* Indian tribes," and he speaks of "*the* Indian traditions," just as one might refer to *the* European fable or *the* Asiatic myth, but in all probability the Indians about St. Thomas half a century ago were Ojibwas, or some other branch of Algonkin stock.

"The Indians of North America are for the most part a wandering race, deriving their precarious support by fishing and hunting, a course of life so unfavorable to the propagation of the human species. They are generally tall and well made in their person and their complexion is of a dark copper color. They are taciturn to an extreme and are not easily moved by pleasure or pain, bearing either with the seeming indifference of a stoic philosopher.

"There is little doubt on my mind but that the Indians of this continent are descended from the *two lost tribes* of Israel which the 'Sacred Volume' informs us separated from the other *ten*. The similarity between the Hebrew and Indian languages, the figurative expressions and soft euphony with which each so beautifully abound, as well as many of the ancient rites of the Jews, which characterize the poor red man's devotion when praying to the 'Great Spirit' are all convincing reasons to believe that the untutored savages of North America are descended from the ancient Israelites, the once favored of Heaven!

"Some antiquarians are of the opinion that they are descended from the Scythians, and indeed the cruelty and ferocity they inflict upon whatever prisoners they take in war agree with the most authentic records of that warlike and barbarous people. Others believe that they may have been a colony from ancient Rome, whilst some are to be found who say that they were once a learned, warlike and commercial people, but after a long residence degenerated into their present state of degradation. Fortifications are to be met with in several parts of Canada, and about them are to be found helmets, spears and other military weapons, as well as pottery and several

other articles, which prove to a demonstration that Canada was formerly inhabited by some race of men of far superior intelligence in the art of war and civilization to the present aborigines. And yet the Indians have not the least tradition upon which we might base a conjecture as regards those forts and tumuli which exist in every district in United Canada Thus, after being tossed from one conjecture to another, we are at last compelled to drop the subject in conscious ignorance and leave it for the accumulated wisdom of future ages to unravel.

"The Indian tradition of the creation, can, in my opinion, be traced to some indistinct recollection of the account as given by Moses in the first chapter of Genesis.

"The 'Great Spirit,' when about to speak this world into existence, assumed the form of an immense bird, and flew over the *chaos*; when he floated majestically, the undivided elements became a perfect plain; when he flapped his wings the earth moved into hills and valleys,—the water into oceans, lakes and rivers.

"The 'Indian Summer,' which generally takes place in October, and continues, sometimes, as long as six weeks, is the most beautiful and agreeable part of the year; and surpasses in balmy influence, all we can imagine of the climate of Southern France. During this delightful season the earth is enveloped by a refreshing vapor, which does not partake of the qualities of fire or water, and through this rectified ether you behold the sun in clouded majesty, giving to vegetable life all the freshness peculiar to the land of 'the happy valley.' Some Indian tribes believe that this smoky weather is caused by the aborigines of the 'far west,' setting on fire their savannas, trackless prairies, and interminable forests. Other tribes, that it is caused by the happy hunters in 'the land of spirits,' offering sacrifice to the Great Spirit, for having bestowed upon them such delightful hunting grounds and rivers teeming with fish. Nevertheless, the greatest admirer of nature can only enjoy the delightful season of 'Indian Summer' and attribute the phenomenon to some peculiar characteristic in the climate of Canada, which has long, but to no purpose, attracted the attention of every resident of this appendage of the British Empire."

MUSIC OF THE PAGAN IROQUOIS.

The same argument that applies to the study of things material connected with primitive life, has equal force when it affects every phase, condition or circumstance of early society, and the pursuit of pre-historic archæology, either in its purely material form, or as it may be otherwise aided, is not conducted merely because of the bald fact that this or the other people happens to be concerned, otherwise than in so far as the study may assist us in arriving at a knowledge of developmental stages, from a generalization respecting which among many peoples we may arrive at the why and wherefor of where we stand ourselves.

Theories respecting the origin of music, are almost as numerous and as varied as are those that have been propounded to account for the beginnings of speech, but with speculations of this kind we have nothing further to do than to supply what we can to the general stock of information, an accumulation of which may, in time, aid some student in arriving at well-founded conclusions.

We are fortunate in being able to procure from the lips of the Iroquois people themselves such songs as have, in most instances, been received by them from a long line of ancestors, and in all probability with but slight variation—in some instances, I am almost certain, without any.

The case would have been different had our sources of information lain among the christianized nations—Caniengas, Oniedas, Tuscaroras,—but it is not likely that the pagan nations—Senecas, Onondagas and Cayugas, would, at any rate, consciously, allow innovation even to the extent of a note. Proof of this may be found in the determination they have maintained, to use only the old-time drum and rattles when these songs are sung, notwithstanding the fact that their congeners on the New York reserve have introduced the use of brass instruments during similar ceremonies.

All the following songs are as sung by the Senecas. No attempt has yet been made to procure Onondaga or Cayuga versions, and until this is done, it will be impossible to make any comparison should differences exist. My own opinion is that if there be any difference the older and purer forms will be found among the Cayugas.

With a continuation of the interest that has been manifested in this subject by the Hon. G. W. Ross (now Premier, and formally Minister of Education), it will be possible to bring together a mass of aboriginal musical notation of extreme value to the scientific musician as well as to the ethnologist. As an illustration of the extent to which we may contribute, the following extract will supply some idea

In a recent article on The Primeval Language* the writer takes the novel, but reasonable enough ground that music is but a "development of the early power in speech," which, he claims, consisted at first of vowel sounds only. After giving a few examples of words so compounded from Polynesian speech, such as *aeaea, aoao, aia, auau, aeoia, iaua,* etc., he proceeds :—

"But besides the mere variation and repetition of simple sounds, in itself a very rich resource, the primeval tongue was rich in many other resources. It had a very wide range of tone. The men of old sang up and down the scale, instead of merely dragging their words evenly across it as we do. And one must go to a land where the tone element still survives to realize what a very rich resource this would be. Take the Siamese, for instance, who have a rich diapason of tones, and listen to them singing to each other, rather than speaking, and one realizes how much music can be in speech. Gaelic, to come nearer home, has much the same element, and that musical element has come clear through into the modern dialects, in which English vocables are overlaid on Gaelic sounds. Thus Cork and Kerry at the one end, and Fifeshire and Edinburgh at the other, have a definite melody in every phrase. And so it was in the primeval tongue ; to the almost infinite expressiveness of speech itself was added the quite expressiveness of music.

And all our music is a development of this early power in speech, which has been gradually dying out of our speaking, as it has grown into song. Many old tongues kept it, but for holy uses or magical ends only. It appears as *swara* in the Vedic hymns. Read them and you are inclined to scoff at their claims to magic ; but hear them chanted by a full choir till the air rings and the very walls seem to vibrate, and you will be ready to profess as thorough a belief in incantations as any magician or astrologer of them all. Within a month I have heard the very same chant in a fire-temple of the Parsees in Bombay and in the Cathedral of the Saviour at Moscow ; how much of our Church music has the same origin, would be a matter of uncommon interest to know. Much of it may carry us back to the Chaldeans of the days of Daniel ; even then it was but a survival of primeval speech.

Then, again, besides the tone of single vowels there is the sing-song or cantilena of whole sentences corresponding to musical melody ; and here, too, the primeval tongue was rich. And another musical quality—stress—ranged from *pianissimo* to *fortissimo*, and added a new richness to expression.

* The Primeval Language, by Charles Johnston, *Contemporary Review*, for Nov. 1899, pp. 698-9.

If music be magical, touching the emotions directly, then the oldest speech was full of magic; and we may well describe it by saying that it consisted of streams of vowels set to music, with all the qualities of tone, melody, stress and time which music possesses."

Respecting the use of vocables in the singing of primitive songs, the writer just quoted favors the belief that they never had any meaning—that they are simply words fitted to the music, as a result of whim, or, perhaps, of supposed suitableness. Another view is that, although in most cases, the so-called words are now devoid of significance, it was not always thus, and that what remains represents words, either of what we may call a hieratic vocabulary, or of an old form of common speech.

What follows from the pen of Mr. Cringan will be read with much interest. He has been at infinite pains to arrive at accurate representation of the various songs, and in many cases this was not free from considerable difficulty.

As the graphophone cylinders, bearing the songs, have been preserved, reference may be made to them by musical experts, by arrangement with the Education Department.

Pagan Dance Songs of the Iroquois.

By Alex. T. Cringan.

The publication of a collection of native Indian melodies in the Archæological Report of last year has evoked many expressions of interest in the subject from eminent archæologists and musicians in Europe and America. The action of the Education Department, in seeking to preserve the songs of our native tribes from the oblivion which would otherwise result, has been received with many manifestations of commendation. It has been felt that the results attendant on the experiment of last year warrant a further investigation of the subject on a more extended scale.

In the previous endeavour to secure a transcription of Iroquois songs the notes were written while being sung by Kanishandon who had been selected by his brethren as the most skillful exponent of Iroquois song. The process employed was necessarily somewhat crude and laborious, but, it was the best available under then existing conditions. Doubtful passages had to be many times repeated before their notation could be even approximately determined and, in a few instances, compassion for the singer demanded that further repetition be discontinued. The desire to secure the largest possible collection of musical records of unquestionable accuracy, developed methods which were ultimately productive of most satisfactory results.

The most scientific of modern devices for recording sound was employed in the form of the graphophone. It was thought that by the employment of this instrument vocal repetition of the songs would be unnecessary, while the accuracy of the records permanently impressed on the waxen cylinders would enable the investigator to test the truthfulness of the transcriptions at any time.

Two native singers, Kanishandon and Dahkahhedondyeh, were selected as being the most capable and reliable exponents of Indian song. In accordance with Mr. Boyle's instructions they were occupied, for several months previous to visiting Toronto, in preparing a list of the most important tribal songs within their knowledge. In this they were aided by the advice of various natives of the reserve who were acknowledged authorities on the subject.

It must be admitted that some doubts were experienced regarding the results on the Indian mind of the effect produced by hearing their own voices emanating from what their native superstitions might lead them to consider a "devil machine." These were soon proven to be groundless. In order to demonstrate the action of the graphophone their own "Pigmy Song" was sung by the writer, and immediately reproduced. They were so surprised and delighted by the result that no persuasion was necessary to induce them to sing into the receiver while the recorder was making the almost invisible indentations which are now preserved as a permanent record of Indian vocalisation. The singers sang their best and the graphophone worked so successfully that the experiment resulted in the acquisition of no fewer than forty-seven authentic records of typical Indian melodies.

The transcription of these into musical notation presented a task of considerable difficulty. Fortunately, however, the graphophone is not made of muscular tissue, and one can compel it to repeat its vocal phrases as often as desired and as slowly as the intricacies of the subject may require, without experiencing unnecessary qualms of conscience or feelings of sympathy for the singer. In the work of transcription every effort has been made to secure absolute correctness in so far as this can be represented by ordinary musical notation. In some instances several hours were occupied in analysing a single melody before the correct notes could be determined. In analysing the songs as sung by a native, various elements of difficulty are encountered. Unlike his more cultured white brethren the Indian has not acquired the habit of falling from the pitch at which he commences his song. I have never heard a native singer flatten or sharpen from the key, but, he does not strike his notes in a manner calculated to impress the listener with the correctness of his intonation. On the contrary, he invariably approaches, and quits his tones with a glide or

scoop which makes the pitch somewhat awkward to determine. Another peculiarity of his vocalisation is the frequency with which he uses the *vibrato* or *tremolo* in songs which seem to express intensity of emotional feeling. Grace-notes he uses freely in the ornamentation of his musical phrases. The source of greatest difficulty is found in the *tonality* of the majority of his songs. To ears accustomed only to the tonality of modern music the modes employed in Indian songs must be exceedingly difficult to define. Modern music is confined to two modes, major and minor, in both of which there exists what is technically known as a leading-note at the interval of a semitone below the tonic or fundamental note of the scale. In most of the Indian melodies the absence of this leading note, essential to modern harmonies, is conspicuously noticeable. This peculiarity is not confined to Indian songs but may be observed in many of the older melodies of Scotland, "Auld Lang Syne" and "Scots, wha hae" may be quoted as familiar examples of this peculiarity. In modern music, harmonic laws demand that the final note be a constituent of the fundamental chord of the key in which the composition is written, but with the Indians all harmonic laws are freely disregarded, and their songs end on any tone of the scale which may be found convenient. This peculiarity tends to dispel the conclusive effect which is usually expected at the close of a stanza, and it may be assumed that this is precisely the object which the Indian has in view. In the ballads of civilized peoples each stanza treats of some specific aspect of the principal theme, and the music ends in a cadence which gives the effect of a close, partial or complete, before a return is made to the beginning for the opening of a fresh stanza. Were this the case in Indian songs, the main object for which they exist would be completely frustrated. The majority of Indian songs are employed as an essential adjunct to the various ceremonies so intimately interwoven into the life-fabric of these primitive people. The theme of their songs is at all times simple as the habits of the people of whose lives it forms a part. In connection with their ceremonials this simple theme is repeated continuously until the close of the ceremony, of which it forms a part, when it is brought to an abrupt close irrespective of the point in the musical phrase at which this close may be demanded. Were the melody to end in a definite musical cadence, suggestive of a close, as in the modern ballad, the attainment of this desired effect of continuity of sentiment would be rendered impossible. When the Indian wishes to emphasize the close of his melody he employs a method characteristically unique and even more convincing than the most perfect of conventional cadences. This is simply a long drawn out *whoop*, commencing in the upper region of the voice and gliding downwards throughout the compass of a fifth,

and occasionally a complete octave. This whoop is frequently preceded by a short staccato ejaculation, not easily described. In some instances the *whoop* is omitted, in others it is repeated.

One other distinguishing characteristic of Indian song calls for discussion. If the melodies included in the present collection are analysed, it will be observed that nearly all commence on the upper and end on the lower tones of the scale. It would seem as if the singer used this means in order to command the attention of his audience to the opening strains of his song. One cannot listen to the initial phrases of such as the "Scalping Song" or the first "Discovery Dance Song" without being convinced that this intention is distinctly manifested.

The space available within the limits of this Report will not permit of a detailed analysis of individual melodies, consequently much has to be withheld which might otherwise be written.

In "Returning from the Hunt" (No. 1), the tonality is distinctly that of A minor, although the leading tone, G sharp, is absent. To avoid unnecessary repetition of reference to this peculiarity, it may here be stated that, of the songs composing this collection, two examples only of the leading-tone, or major seventh, of the minor scale are to be discovered. It is interesting to observe that both of these are found in songs peculiar to women, viz.: Nos. 21 and 36. Whether this would imply that the Indian woman is possessed of a finer musical instinct, or is more advanced in her tendencies than her lord and master, the reader is left at liberty to determine. In this, as in No. 2, we have a melody of a decidedly cheerful and inspiriting effect. It is strongly expressive of the feelings likely to be experienced on returning from the hunt well laden with the spoils of the chase.

The second group introduces a gruesome subject. I am informed by Dahkahhedondyeh that No. 3 was sung by the brave of olden times when his foe was vanquished and he was about to secure the coveted scalp, while No. 4 was reserved, as a song of exultation, on the accomplishment of this barbaric practice. From a musical standpoint, each contains at least one outstanding characteristic. It will be observed that No. 3 contains five beats in each measure after the opening phrase in two-four time. It cannot be said that this effect is in the least unpleasant. On the contrary, it is one of the most rhythmical melodies in the collection, which serves to emphasize the fact that the Indian mind is capable of definite rhythmical conceptions, the expression of which is vividly coloured by his unique personality. No. 4 seems to open with a similar rhythm, as a measure of three-four combined with one of two-four gives, approximately, the same effect as one of five-four time. This might have been expressed in another way, by writ-

ing a pause over the second beat in the second measure. This, however, is immaterial, as the most important feature presented is the modulation from A minor to A major, in the third line. This modulation is freely used in modern compositions. A familiar example may be found in Dr. Dyke's beautiful hymn-tune, "Vox Dilecti," usually associated with the hymn commencing, "I heard the voice of Jesus say." The modulation, in this, is accomplished by a leap of a *major* sixth from the fifth of the minor key, and, it will be observed that precisely the same means are employed in the song under discussion. This again presents a wide field for speculation. Have the Indians any sub-conscious perception of the recognised close relationship which exists between a minor key and a major on the same tonic? Why does this melody fail to return to the original key? Have they acquired this means of modulation from hearing modern compositions? I am assured by my Indian friends that this is among the most ancient of their traditional melodies, consequently the latter question may be answered in the negative. The others must become the subject of future investigation, while the melody remains to speak for itself. The "Old Chief's Favorite Song," No. 5, is an example of pentatonic melody, as it contains five scale tones only. This is the favorite scale of the Indians, as was fully described in the previous Report. The "Second Chief's Favorite Song," No. 6, presents an example of a rhythmical figure, two measures in length, reproduced continuously without interruption. The absence of the leading-tone D natural is again noticeable.

The precise sense in which the title "Discovery Dance" is applied to the next group is somewhat difficult to determine. Dahkahhedondyeh explains that "These songs were sung during the progress of a duel with knives, and, that the title refers to the effort of the brave to *discover* his opponent's weaker points of attack." In listening to this group, a strong expression of exultation and defiance is readily observed. In No. 7 we have another example of pentatonic melody. The next might almost be mistaken for a modern bugle call, as, with the exception of the A in the first measure, it contains no tones other than those of the fundamental chord of B flat.

As their name implies, the following group consists of songs employed during the night watch beside the dead. Nos. 10 and 11 are pentatonic melodies, befittingly weird and mournful, while No. 12 is so indicative of excitement and passion as to seem entirely at variance with the sentiment of the mournful ceremony in which it is employed.

In the "Four Nights' Dance Songs" we have several examples of the final *whoop* already mentioned. Musical notation cannot give adequate expression to the effect produced by this characteristic end-

ing. It is simply a yell commencing on a high note and gliding downwards with diminishing force. Of the eight songs included in this group the leading tone is found in No. 18 alone, the others being strictly pentatonic in construction. The last of the group, No. 20, is strikingly suggestive of an ancient Gregorian chant. If we exclude the F introduced for the final whoop it will be observed that the melody is confined to two tones, the first and third of the key of C minor.

The Women's Dance Song introduces a pleasing example of the effect of mixed rhythm. The opening period comprises five measures of animated rhythm in four-four time, equalling in dash and *abandon* the most modern of popular "two-steps." This is quickly succeeded by a graceful movement in waltz time, producing a pleasing contrast in which the essential elements of unity and variety are combined with artistic intuition sufficient to satisfy the most advanced of modern musical critics. As already stated, this song presents an example of the employment of the complete minor scale including the major seventh or leading-tone rarely met with in the music of the pagan Iroquois.

In former investigations the pathetic character of the 'War Dance Song" led me to question its fitness for the ceremony with which it is associated. On discussing this with Dahkahhedondyeh he informed me that there are two songs associated with the War Dance, the first being sung at the preliminary pow-wow at which the question of engaging in war is discussed, and the second, when it has finally been decided to march on the war-path. A comparison of No. 22 with 23 elicits some interesting features. Both are composed of the tones of pentatonic scale of G minor, the plaintive first and fourth being prominent in each. Owing to the slow tempo of No. 22 the effect of these two tones is intensified thus producing an effect at once pathetic and thoughtful. In No. 23 the rapid tempo, combined with the hurried reiteration of minute rhythmic divisions, completely obscures the mental effect of individual tones. The effect is strikingly fierce and vindictive and thoroughly in keeping with the sentiment which it is designed to portray.

The three songs included in the next group are simple in character as they serve only to supply a musical accompaniment to the primitive games suggested by their titles. Their counterpart may be found in such games as "Jing go ring" or "London Bridge" well known to the children of all English speaking races.

The Death Feast Song must not be confused with the Wake Songs, as it forms part of an entirely different ceremony, having as its principal objects the commemoration of the departed. The melody

is very simple in construction, possessing no new features of interest, with the exception of the close on the fifth of the scale.

In the Joining Dance Song, No. 28, the most noticeable feature is the syncopated rhythm employed in every measure. This rhythmic peculiarity is so strongly characteristic of Indian melody as to lead some investigators to the conclusion that the Indian has no definite conception of rhythm as the term is understood among musicians. A careful study of the various melodies here presented should convince the most sceptical that the Indian mind is capable of definite rhythmic conceptions, but that he is not subservient to pedantic musical laws, reserving to himself the right to express his musical sentiment in a manner peculiarly his own.

The term Ahdonwah, which distinguishes the group of songs now to be discussed, means literally, "Songs of Joy." The first presents several examples of syncopated rhythm referred to above. The most interesting melody of the group is No. 30, in which we again have an example of mixed rhythm produced by the insertion of measures containing four beats, the normal measure consisting of three. It will be observed that the key signature is that of A Major, while the first and second measures are distinctly in the key of A minor. Both keys are freely employed, and as if to emphasise this fact, the interval of the minor seventh from the tonic is used in each in a manner which cannot fail to be understood. In No. 31, a new example of mixed rhythm is afforded by the insertion of a single measure of five-four time.

The use of the second of the minor scale is very rare in Indian melodies. The interval of a semitone by which it is related to the minor third of the scale does not seem to be favourably regarded by primitive races. Some eminent musical authorities maintain that the employment of the pentatonic scale is mainly attributable to the aversion which primitive folks evince towards this interval. To omit all tones which necessitate the employment of an undesirable interval is certainly a most effective means of getting over any apparent difficulty which its employment might entail. In the song connected with the ceremony of making chiefs, No. 45, this rare interval is freely used, while in No. 36, we have the additional semitone consequent on the introduction of the major seventh, or leading tone of the minor scale. The latter belongs to the group of songs sung by the women who may be left in charge of the camp while the braves are on the war-path or engaged in the hunt. In No. 38 the change from four-four to six-eight time is again noticeable, and it is interesting to note that in this, as in the previous instance it occurs in the women's song.

Of the Green Corn Dance song two forms are given. The old

form, No. 40, seems to have been employed in some way which led to its being considered unfit for use in the sacred feast of which it had previously formed a part. The demand for a new song resulted in the composition (?) of No. 41. The reader is left to draw his own conclusions regarding the originality of the composition. The rests shown in various measures are not such in fact. The music is simply interrupted to permit of the insertion of *spoken* interjections which cannot be represented by any system of musical notation.

The most prominent feature of the "Naked Dance Songs" is the unconventional measure in which they are sung. In No. 42 we have the only discoverable example of the exclusive use of five-four time, while No. 43 is equally unique in the employment of the most exceptional form of measure in seven-four time. The latter may be regarded as composed of three and four beat measures alternately, but this only serves to increase the difficulty of determining which is intended to come first. In listening to this melody as sung by Kanishandon, no doubt could be entertained regarding the accentuation of the first beat of each group of seven, while examination reveals the fact that the rhythm is distinctly repeated at the distance of two measures of seven beats each.

The three remaining numbers of the collection present no characteristics apart from those already discussed.

In order to appreciate the genus of pagan Indian song, one must become thoroughly familiar with it through constant repetition. The habits and customs of the people by whom they have been evolved must also be carefully taken into account. When it is considered that these songs have been produced by a people among whom musical notation is utterly unknown, the unprejudiced investigator must be surprised at the nascent ability which they exhibit. Although these simple melodies have descended by tradition from time immemorial, it must not be presumed that the form in which they originated has been preserved intact. On the contrary, they represent a gradual development unconsciously effected by the many generations through which they have been transmitted.

Of the variations which they have undergone we have no means of ascertaining, but, that they are even now subject to alteration we are assured. In a few years some might be irretrievably lost; their existence remembered only as myth.

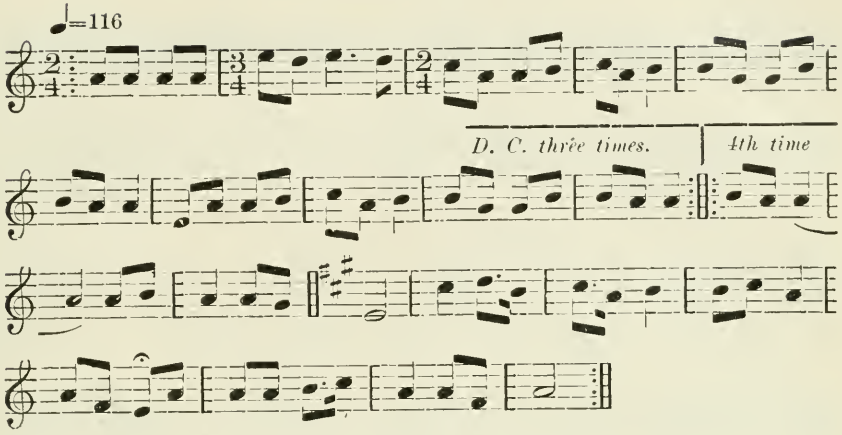
That they are worthy of a better fate must be conceded by all interested in the history of these primitive peoples. It is hoped that the attempt now made to represent them in musical notation will result in their preservation, not alone for the satisfaction of ethnological students, but for the descendants of the natives in whose ceremonials they have played so important a part.

No. 1. RETURNING FROM THE HUNT.

No. 2. RETURNING FROM THE BUFFALO HUNT.

No. 3. SCALPING SONG.

No. 4. AFTER SCALPING SONG.



No. 5 OLD CHIEF'S FAVORITE SONG.

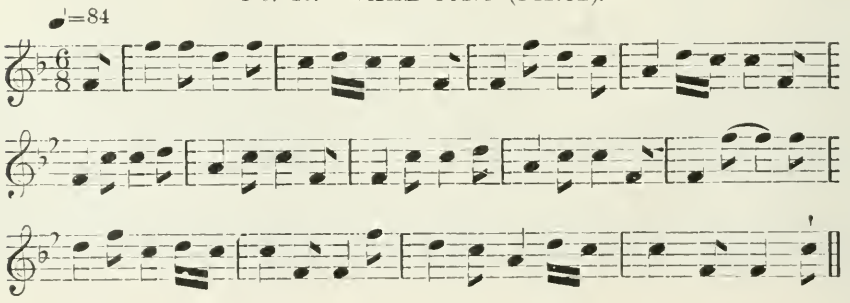
No. 6. SECOND CHIEF'S FAVORITE SONG.

No. 7. DISCOVERY DANCE SONG (FIRST).

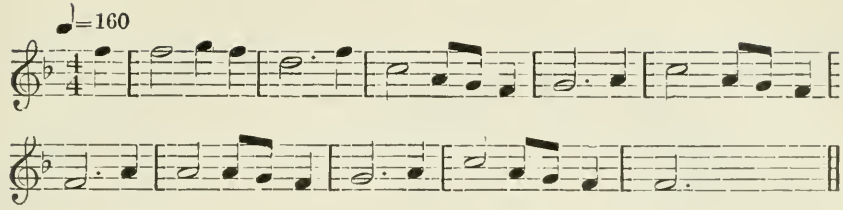
No. 8. DISCOVERY DANCE SONG (SECOND).

No. 9. DISCOVERY DANCE SONG (THIRD).

No. 10. WAKE SONG (FIRST).



No. 11. WAKE SONG (SECOND).

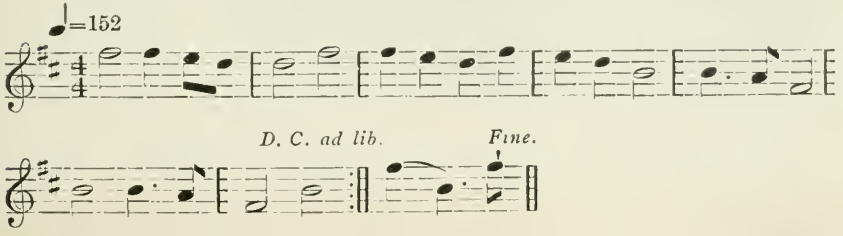


No. 12. WAKE SONG (THIRD).

No. 13. FOUR NIGHTS' DANCE SONG (FIRST).

No. 14. FOUR NIGHTS' DANCE SONG (SECOND).

No. 15. FOUR NIGHTS' DANCE SONG (THIRD).



No. 16. FOUR NIGHTS' DANCE SONG (FOURTH).

No. 17. FOUR NIGHTS' DANCE SONG (FIFTH).

No. 18. FOUR NIGHTS' DANCE SONG (SIXTH).

No. 19. FOUR NIGHTS' DANCE SONG (SEVENTH).

No. 20. FOUR NIGHTS' DANCE SONG (EIGHTH).

No. 21. WOMEN'S DANCE SONG.

No. 22. PRELUDE TO WAR DANCE.

No. 23. WAR DANCE SONG.

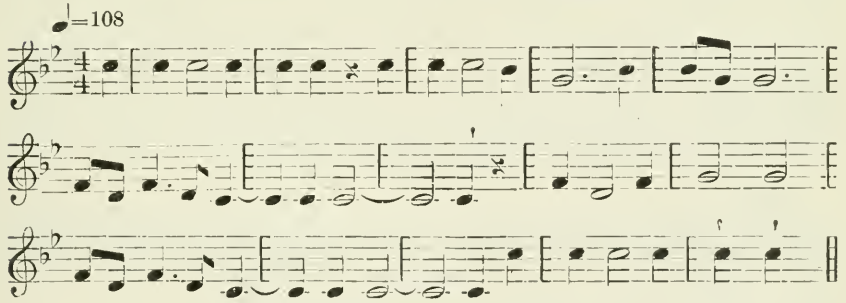
No. 24. HIT STICK SONG.

No. 25. CHANGE BODY SONG.

No. 26. BEAN SONG.

No. 27. DEATH FEAST SONG.

No. 28. JOINING DANCE SONG.



No. 29. AHDONWAH (FIRST).

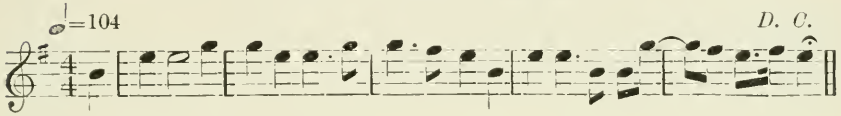
No. 30. AHDONWAH (SECOND).

N0. 31. AHDONWAH (THIRD).

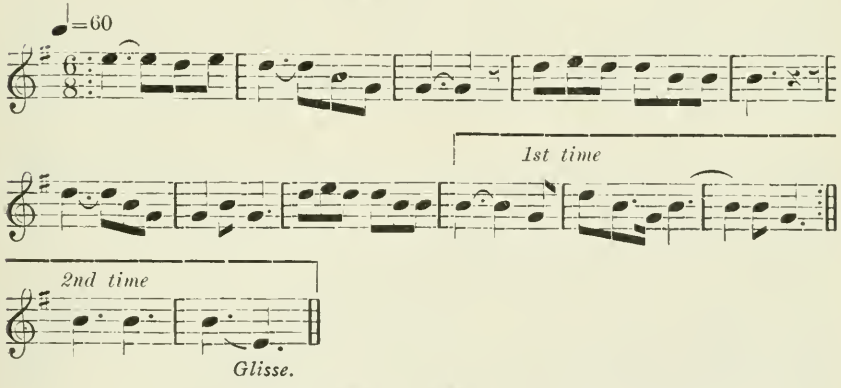
No. 32. AHDONWAH (FOURTH).

No. 33. AHDONWAH (FIFTH).

No. 34. MAKING CHIEF SONG.
(*When on the road from fire to fire.*)
See Hale's Book of Iroquois Rites.



No. 35. MAKING CHIEF SONG.
(*On arrival at the fire.*)



No. 36. LONESOME WOMAN'S SONG (FIRST).

No. 37. LONESOME WOMAN'S SONG (SECOND).

No. 38. LONESOME WOMAN'S SONG (THIRD).

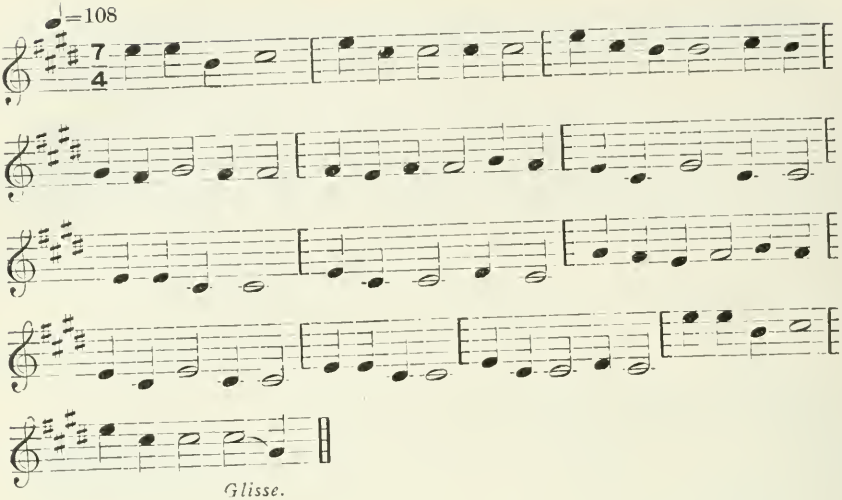
No. 39. JOINING HANDS DANCE SONG.

No. 40. GREEN CORN DANCE SONG (OLD FORM)

No. 41. GREEN CORN DANCE SONG (NEW FORM).

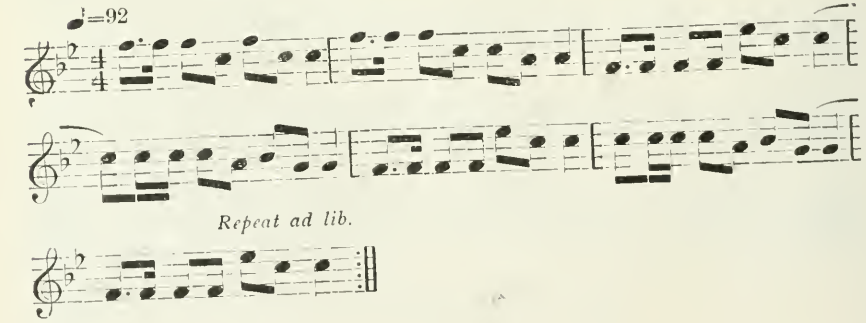
No. 42. NAKED DANCE SONG (FIRST).

No. 43. NAKED DANCE SONG (SECOND).



No. 44. NAKED DANCE SONG (THIRD).

No. 45. OLD MAN'S FAVORITE SONG.



No. 46. YOUNG MAN'S FAVORITE SONG.

No. 47. NAMING OF THE BOY.

A STUDY OF THE WORD *TORONTO.*

BY GENERAL JOHN S. CLARK

Every Indian geographical name must describe accurately some feature of the locality to which it is affixed. The description may relate to some topographical feature, to some historical event, to a residence of some noted chieftain, to the natural productions, or to some relation to some other place Frequently a name is applied to more than one place, but it must be under such circumstances that no mistake or misapprehension can arise as to the meaning. Occasionally names are used figuratively, as was the case with that of the great Iroquois confederation, Kanonsionni, from kanonses or kanonsis, *a house*, and ionni, *extended* or *drawn out.*—thus using the figure of a long-house as representing their political structure. They carried the figure still further. As each of these houses had a door at each end, they also had doors at the eastern and western extremities of their occupied territory, the eastern guarded by the Mohawks, the western by the Senecas. As several of these long-houses constituted a village or castle, and was surrounded by an enclosure of palisades, it became necessary to have openings through the enclosure at different points to pass in and out for wood, water and other purposes. Their confederation was also enclosed by an imaginary structure, having gateways for purposes of peace or for military operations offensive and defensive, and parties having business with the confederation must first make that business known to the guard at one of these gateways, and whoever entered by any other way placed themselves in a position to be suspected of having evil purposes, and being treated as spies and enemies. Every other confederation had like places, well known and recognized by their neighbors. These places sometimes had local names, and when it was desired to describe them as gates, it was done by adding the word for *gate* to the local or general name. Thus Lake Champlain became known as Caniaderi Guaruntie. In precisely the same manner Lake Simcoe at an early date was known and recognized as the Lake Door or Gate-way of the country of the Hurons. It will be readily seen by an examination of maps that all intercourse with the Hurons, whether relating to peace or war, from the south and east, must necessarily pass through Lake Simcoe. Many routes of travel centered in that lake, and in aboriginal intercourse, as in modern times, it was a key to inland navigation. When Lake Ontario was closed to all other tribes, as described by Champlain, and the inland waterway *via* Quinte Bay became exceedingly dangerous, all the commerce of the Hurons with the French sought the much longer and more difficult route of the Ottawa as fraught with less danger. This

change increased the importance, temporarily, of Matchedash Bay as a gateway to the Huron country. After the Hurons were driven out and Indian commerce returned to the natural channels, it was then and in this manner that the name of *Toronto* became prominent as the name of the bay of the same name, as the southern terminal of what may well be called the international inland waterway between Lake Ontario and the great northwest. If the theory advanced by the writer is correct that Toronto is an abbreviated compound word, somewhat disfigured, but based on kaniatare, *lake*; and iokaronte, *a gap, breach,* or *opening,* then it has always been the name of *Toronto Bay* considered simply as a bay. And this will be the same if Dr. O'Callaghan's theory be true, for his derivation reaches the same conclusion, and each will agree with Dr. Lewis H. Morgan who gives Neo-da-on-da-quat, *a bay,* as the name of Irondequoit Bay. Neither is there any material variation from the Rev. Asher Wright, who gives the meaning of the name as 'the turning aside of the lake,' as this constitutes the bay. All parties reach the same conclusions by slightly varying methods of explanation. In none of the theories where this name has been discussed has any idea been presented of a possible origin from karonta, *a tree*; or karonto, *a tree or log in the water* except at present Toronto. As must be conceded, this last derivation must be erroneous, as it would be impossible to find the name in different localities several hundred miles apart based on a fact appurtenant to one location. This is a violation of the fundamental rule relating to Indian place-names that the fact on which the name is based must be common to all the localities. This can only be found in the word signifying 'an opening.' If an opening from a lake, as a bay, the name will disclose it, as Toronto bay, or Ouentaronto, this last meaning the lake that constitutes the opening or gateway of the country, and this brings us around to the Mohawk form of Caniaderi Guaruntie, of which Governor Pownall gives the meaning, as "The Mouth or Door of y^e^ Country."*

* "Lake Champlain, as the French call it; Corlaer, as the Dutch call it; but according to its Indian name, Caniaderi Guarunte, lies in a deep, narrow chasm of the land, bounded up to the water's edge with steep mountains on the western shore which continues as far as Cumberland Bay. Pownall, 1776. p. 13. On the map appears the legend "L. Champlain, called by the Indians Caniaderi Guarunte, signifying the Mouth or Door of ye Country." Analysis of Pownall—Evans' map 1776.

Gov. Pownall, in writing to Under Secretary Wood in 1758, says:

By the reduction of Cape Breton and its dependencies, the uninterrupted Dominion of these Seas and the Powers of Trade are again restored to His Majesty's Subjects; by the destruction of Fort Frontenac and the naval armaments and stores at Cadaraqui, the Dominion of the Lakes which sooner or later will be the

Rev. Jean de Lamberville, missionary at Onondaga in 1684, in writing to M. de la Barre in October of that year, says: "Had I the honor to converse with you somewhat longer than your little leisure allowed me, I should have convinced you that you could not have advanced to Kania-*Toronto*-Gouat, without having been utterly defeated in the then state of your army, which was rather a hospital than a camp." This was the present Irondequoit Bay, near Rochester, New York, a body of water substantially of the same general features as Toronto Bay. Evidently de Lamberville was skilled in the Iroquois dialects, and knew the meaning of the name as understood by the Onondagas. Dr. O'Callaghan, the learned translator, says in a note, "Literally an opening into or from a lake; an inlet or bay; from Kaniatare, *a lake*, and Hotontogouan, *to open*.—(Col. Hist., N. Y., IX. 261.) This is in line with the statement of Spafford in 1813, author of Spafford's Gazette, of N. Y., in which he says "Teoronto was the proper name of Irondequoit Bay, meaning in Onondaga *almost a lake*." The name given by De Lamberville is in accord with the names of the bay appearing in the Franquelin great map of 1684, Gannia-*Tareonto* Quat, and Gannia-*Toronto* Gouat; and of the Jesuit's map 1665 Andia-*Taronta*-Ouat; of Denonville's account of his expedition, 1687, Gannia-*Taronta*-Gouat, and numerous others. This particular form appears to have been compounded from Kaniatare, *lake*, and the Onondaga term *to open*, as given above, and appears to account for the terminal gouat of De Lamberville and others. Cuoq gives Iokaronte, *an opening*, and Bruyas, Gannhotongouan, *to open the door*. The several words appear to rest on a common base, meaning an opening, or its equivalent, and in

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Dominion of America, is restored to the British Empire; and from the prosperous way in which the Western operations now are by the reinforcements brought by Major General Amherst, I cannot even entertain a doubt but that *the very gates of Canada* (as Lake Champlain is truly called by the Indians) must be put into our hands, so that for the future the enemy must live with us in peace, or not at all.

Boston, 30 Sept., 1758. Col. Hist, N.Y., VII., 349.

Gov. Pownall states in his Administration of the Colonies (Ed. 1768 and 1774, p. 267) that the Indian name of Lake Champlain is *Caniaderi Guaruntie*, that is "The lake that is the gate of the country." It is compounded of "Kanyatare," the Mohawk word for lake, and "*Kanhohkaronde*," door.—Doc. Hist., N.Y., Quarto III, 723.

The early French writers do not refer to the Indian name, but speak of the lake as *the passage* that leads to the country of the Iroquois.—Palmer's Lake Champlain, p. 12.

The Mohawks certainly had abundant reason for remembering Lake Champlain as a door leading to these countries, for Champlain, in 1609, gave them in that quarter their first lesson in the use of gunpowder. And in 1666, Courcelles and Macy ravaged their country and burned their 'castles' with an army that passed through this gateway.

which the idea of door is understood, if not expressed. Rev. Asher Wright in discussing this from the Seneca standpoint, and there is no better authority, says the name is compounded from Ganyiudaeh, *a lake,* and Odaghwah, *it turns aside,* making the name Onyiudaondagwat, literally *the lake turns aside.* As in entering a cabin, the door is opened by turning it aside, possibly the same idea is carried in the name for the bay. As a rule, the earlier forms of the name beginning with the Jesuits' map, 1665, conform very closely to the model of De Lamberville. The variations are such as would arise from different modes of expression in the different dialects. The substance of the several opinions shows that the name signifies simply a body of water connected with the lake *by an opening.* Historically considered, when such an opening became an important factor in reaching the Seneca villages from the lake as a thoroughfare, the signification was brought within the field of a gateway or door to the country of the Senecas, precisely as lake Champlain became the mouth or gateway of the country in general, and that of the Mohawks in particular. From the earliest historical period, each of these places was considered as the gateway of the confederation. Denonville availed himself of the advantages of Irondequoit Bay in 1687, when he ravaged the country and destroyed their castles. After that date the Senecas removed their larger western villages to the vicinity of the Genesee river, but the bay continued as the route through which all the intercourse and traffic connected with the lake was held, and as the veritable gateway or western door of the Iroquois country.

The name of Irondequoit Bay appears in a great variety of disfigured and corrupt forms, but all are based primarily on the Indian word for lake in some one of the Iroquois dialects. The Onondaga term for opening (Ganhotongouen) appears in many of the names, but the precise manner of compounding is not understood. De Lamberville was most excellent authority, and the name of *Toronto* must mean substantially the same as the Seneca form which all authorities say means simply a bay, and taken in connection with Caniaderi Guaruntie as applied to lake Champlain, the conclusion that the two are identical cannot be far from the truth, and that the definition given by Gov. Pownall will furnish a reliable explanation of the meaning of *Toronto* Bay on the north side of the lake. It will be seen that the parallelism between the two bays is especially significant aside from the names. The Toronto of the north, had been known, unquestionably, far back into the prehistoric occupation of the country. It was a new discovery to Joliet and Perray in 1668, and ten years later had leaped into notoriety as a most important thoroughfare, but not for several years did the name that has now prevailed appear on the

maps of that locality. The bay of the south shore has been known from the earliest historical period of the Senecas as their landing place, and the route to their castles. It was beyond question one of the most important points in charge of the Senecas as guardians of the western door of the confederacy. The importance of Toronto Bay and the passage to lake Huron was not fully understood until some years after the construction of Fort Frontenac in 1673. The anxiety of the French to secure a monopoly of the fur trade led them to believe that all the trade could be controlled from that point. It was soon apparent that the Indians and traders found ways to reach the English and Dutch without passing Fort Frontenac. La Salle who was the original projector of that stronghold, in August 1680, on his return voyage from the west, took the Toronto route *via* lake Simcoe and again in 1681 when journeying westward, desiring to reach lake Huron from lake Ontario, availed himself of the Toronto portage, and was for a fortnight engaged in the work of transporting his goods and provisions to lake Simcoe. It was not known as Toronto until some years later, but was called the portage of Teioiagon, which was the name of a small Seneca village near the Humber river. It undoubtedly was known in prehistoric days by some distinctive name. but not until it became part of an important thoroughfare did it take the name of Toronto, the gateway of the ancient Huron country, which implies a way, or route, through which people pass to and fro, as through a gateway in a palisade enclosure. On the map of Raffeix, 1688, is the legend written along the line "*chemin par où les Iroquois vont aux Outaouas.*"* and along the northern shore of lake Ontario appears the following: "*Villages des Iroquois d'ont quan'ité s'habituent de ce cote.*"† A fair copy of this map will be found in the Very Rev, W. R. Harris' History of the Early Missions of Western Canada, and a skeleton copy in Winsor's Hist. of America IV. 234. The map of Raffeix was of about the date when the name of *Toronto* was very generally indicated on the maps of the period. It shows that the Iroquois introduced the name, and not the Hurons, for the latter had long previous to this date been driven from the country or incorporated with the Iroquois. If, therefore, a correct meaning of the name is desired it must be from Iroquois sources, and from their standpoint.

It may be well at this point to allude to the earliest known name of lake Simcoe, which appears as Lacus Ouentaronius on the Ducreux map of 1660. This is the Latinized form of Ouentaron, Oentaronck, and Oentaronk, as given on other and later maps. The map of Ducreux, though dated 1660, was in fact compiled from data of about 1645.

* Way by which the Iroquois go to the Ottawas.

† Villages of the Iroquois, of whom many live in this region.

This was previous to the destruction of the Hurons, and while the Jesuit missionaries were on the ground and in daily communication with them. The missionaries make no mention of *Taronto* as a name of the lake, or in any other connection. The name Ouentaron was used, and I desire to point out a few facts which leads me to believe that Taronto and Ouentaron may have been identical in meaning. The form Ouentaron appears to have continued as the name of Lake Simcoe for over a hundred years, from Sanson, 1656, to D'Anville and other French maps as late as 1755 and later. But beginning with La Hontan, who was in the country from 1684 to 1691, the form *Toronto* appeared and finally prevailed. La Hontan accompanied D'Anville in 1687 in his expedition against the Senecas, and it is somewhat significant that he not only gives the name Toronto to Lake Simcoe, but to its outlet now known as Severn river. He also calls Matchedash Bay "The Bay of Toronto," which he describes as twenty-five leagues long and fifteen wide. He places the name on some of his maps between Ohouendoe Island* and the mainland, and other mapsapparently following La Hontan carry the name *Toronto* quite up to the River of the French. La Hontan names one of the Huron villages Torontogneron, which he says was destroyed by the Iroquois, and locates it near Lake Couchiching. Raffeix, on his map of 1688, makes Lac Tarontha as the name of Lake Simcoe, which is very near the word given by Cuoq of Kah-ron-tha, *to make an opening* (93). Denonville, in writing to M. Seignelay in Nov., 1686, says M. de la Durantaye is collecting people to fortify himself at Michillimacina, and to occupy *the other passage at Taronto*, which the English might take to enter Lake Huron. (Col. Hist., N.Y., IX. 296). Now, if as I suspect, *Toronto* is a contracted form of a compound word derived from Kaniatare, *lake*, and onto, *to open;* and the name Ouentaron is also a compound Huron word derived from the Huron ontare, for *lake*, and a root equivalent in Huron to *open*, or *a door*, or *gateway*, it will go far to establish an absolute identity between the two names Ouentaron and Taronto. Both of these names based on Ontare, *lake*, will explain why the Hurons were known as Lake Indians, and their country, or at least the country around Lake Simcoe, as *Toronto*.

There was another name occasionally applied to Lake Simcoe by the French, which was "Lac aux Claies," which in English would be "The Lake of the Fish Weirs." These were described by Champlain in 1615, as located between lakes Couchiching and Simcoe, in the narrow channel now known as the Narrows. The Indians, known as Ojibways of the present day, speak of the locality as Mitchekun, which means a fence, or the place which was fenced, or staked across. The

* Christian Island.

structure was composed of small sharpened stakes, from six to ten feet in length, driven into the clay and sand which constitutes the bottom of the channel, and were from an inch to two inches in diameter. Champlain says: "They almost close the strait, only some little openings being left where they place their nets." Probably smaller twigs were woven in back and forth in the form of what is called "wattling." Fish weirs constructed in this manner were common along the Atlantic coast, and are illustrated by White in Harriott's Hist. of Virginia, also in Beverly's Virginia, 1675. In the "French Onondaga Dictionary," from a manuscript of about 1700, in the Mazarin Library, Paris, Gaya-ouenta-ha is given as the equivalent of the French word *Claye*, which in English is *hurdle*, flat screen, or wooden grate. It will be seen that the six letters from the heart of this word, are identical with those found in the name Lacus Ouentaronius of the Creuxius map, supposed to be derived from Ontare, *lake*. Gah-a-yah is given by Rev. Asher Wright as *fence* in Seneca. An analysis of the name Gayaouentaha will probably disclose a fair description of the fish weirs in the Narrows, the base of the French name of Lac aux Claies. This could have only a local significance, unless it should appear that other weirs of like character existed at other points, which is not probable.

On several maps lake Couchiching is named Lake Contarea. The Relations give this as the name of a Huron village and tribe of Kontarea, which Brebeuf describes as a day's journey from Ihonatiria. A site at the narrow passage between the two lakes would be about thirty-five miles from Ihonatiria. The Ducreux map locates L. Contarea a few miles west of Ste. Marie on the Wye, which could not be more than five or six miles from any supposed site of Ihonatiria. These facts appear to indicate that the earlier site of Kontarea was near the narrow passage between the lakes, and that previous to 1645 the village or villages had removed to the west of Ste. Marie on the Wye. The Relation of 1642, p. 74, says: "Last winter the Hurons had a real fright in consequence of a false alarm that had reached them that an army of Iroquois was on the point of carrying the village of Kontarea, the chief bulwark of the country." Burrows' edition XXIII., 105.

The Kontarearonons are mentioned by Vimont in the Relation 1640, p. 35, as a distinct tribe, sedentary, and speaking the Huron language. The name appears as number nine in a list of twenty-nine names, and is followed by the Ouendats. When the Hurons abandoned their country a large number took refuge with the Iroquois and were known as Hurons of Kontarea. That the name was generic, and related to the country of the Hurons in some instances is certain. If

lake Couchiching was known as lake Kontarea, it would be very strong evidence of a residence near it at some earlier period, and that Brebeuf's statement of a location a day's journey from Ihonatiria was correct. An analysis of the name shows that it was derived from Gontare lake in Huron, and as *g* and *k* are interchangeable in Indian names it would become Kontare, this with a diminutive terminal *a*, the result will be Kontarea. La Hontan appears to have had in mind a waterway on all sides of the Huron peninsula by giving the name *Toronto* to lake Simcoe, Severn river, Matchedash Bay and the passage between Ahoendo* and other islands, and the main land. Just what he meant by the name Torontogne is uncertain. The name as given by the Raffieix map of 1688 of Tarontho should be carefully considered in the study of these more or less affiliated names, as this comes very near to the modern Mohawk of Kkahrontha (Cuoq 24) Kkaronte-Kkaronten, meaning *an opening*, as a door or gateway.

It is an interesting fact that wherever this name of *Toronto* has appeared either as combined with other words, or in its evidently contracted form, it has always from the very beginning, been on an important thoroughfare of water-communication. The fact that it has appeared in several positions with several hundred miles intervening, is proof conclusive that the name is not based on any fact incident to any one locality. It must be from something common to all, having a distinct meaning, and must be so clearly expressed "as to convey that meaning with precision to all who speak the language to which it belongs, and whenever from phonetic corruption or by change of circumstances, it loses its self-interpreting, or self-defining power, it must be discarded from the language." This rule laid down by Mr. J. H. Trumbull in his "Indian Names of Connecticut" applies with equal force in Iroquois as in Algonquin place-names.

There is no question whatever in my opinion as to a common origin of Caniaderi Guaruntie as applied to lake Champlain; the Gania *Toronto* Gouen of De Lamberville as the name of Irondequoit Bay, and of *Toronto* as names of Toronto Bay and Lake Simcoe. Each in its place was a gateway of the country. Ouentaron was probably of the same meaning and derived from the Huron Ontare, *lake*, and Taronto, *a door or gateway*. As will be seen later on, the final part of the word-sentence, which carries the idea of a door or gateway, makes it appurtentant to the initial part of the sentence, which describes the character of the body in which the opening is made. Thus Iotstenra, *a rock*, combined with Karonte, makes Iotstenrakaronte, a *a grotto or cavern*, distinctly an excavation in a rock whether natural or artificial, and every grotto or cavern has

* Christian Island.

a door or entrance. Iokahronte is a *gap*, breach or opening; (Cuoq 6, 93) so kkahrontha is to pierce, to make an opening as a door or window, or breach in a wall (Cuoq 24). Katenhenra-karontha is given in the verbal form, *to make an opening in an enclosure and put a gate in it* (Cuoq 93). A curious example is given by Cuoq (93) which is Tekahontakaronte. This appears to be Honta, *an ear*, the organ of hearing; Tekahonta, *two ears*, that is, the two openings in the head, the organs of hearing, which sometimes become obstructed, and the person becomes deaf or partially so. Tekahontakaronte then means to open the two openings that the person may hear.

Auburn, N. Y., Dec. 30, 1899.

DANIEL GARRISON BRINTON.

Born in West Chester, Pennsylvania, U.S.A., May 13th, 1837. Died, July 31st, 1899.

When reference was made in the report for 1896-7 to the death of our distinguished friend Horatio Hale, it was said, " Mr. Hale's place in scientific ranks will be hard to fill and perhaps none will more readily acquiesce in this statement than Dr. D. G. Brinton, of Philadelphia, who, having so long shared his mantle, must now wear it alone." Now that Dr. Brinton himself has departed, the loss, for the time-being, seems almost irreparable.

His services in the study of American ethnology in its very widest sense, can hardly be overestimated. As a thinker he was as bold as he was original, and with respect to conclusions at which he arrived, he sometimes stood alone

Few American writers in any department of science have produced so many books, pamphlets and papers as he did on his favorite subject—even the mere naming of them in type, as they appeared from 1859 until within a few months of his death, would require several of these pages

While inclined to be somewhat dogmatic in the enunciation of what he conceived to be truth, he was too great a man to be jealous of what others had achieved, and he was always willing to assist inquirers with his opinions or advice.

At the time of his death he was Professor of American Linguistics, and Archæology in the University of Pennsylvania.

As an authority on the studies he had so markedly made his own, he will long be quoted, and even when, as is almost inevitable in the advancement of knowledge, it shall appear that he formed some wrong conclusions, he will always be credited with great scholarship, sound, critical judgment, considerable caution, and the courage of his convictions.

UNIVERSITY OF TORONTO.

AUDITOR'S REPORT

TO THE

BOARD OF TRUSTEES

ON

CAPITAL AND INCOME ACCOUNTS

FOR THE

YEAR ENDING 30TH JUNE, 1899.

ADOPTED 1ST NOVEMBER, 1899.

TORONTO:
WARWICK BRO'S & RUTTER, PRINTERS, ETC., 68 AND 70 FRONT STREET WEST.
1899.

AUDITOR'S REPORT.

TO THE BOARD OF TRUSTEES ON CAPITAL AND INCOME ACCOUNTS FOR THE

YEAR ENDING 30TH JUNE, 1899.

Adopted 1st November, 1899.

To the Trustees of the University of Toronto:

GENTLEMEN,—The undersigned begs to present, after due audit, the financial statement for the year ending 30th June, 1899.

The contingent fund has remained unaltered throughout the past year, but although no losses chargeable to capital have arisen, items aggregating $1,082.00 have fallen to be deducted from the income of the year.

Again, there is a deficit upon revenue account to report, but the adverse balance is less than for several years past. The revenue overdraft now aggregates $17,558 29; the largeness of this overdraft is to be deplored, but it should be considered in relation to the seven years' transactions, namely:

Expenditures.	Years.	Fees.	Endowment.
$127,458 90	1893	$35,612 89	$95,228 93
119,305 24	1894	35,537 50	83,284 63
120 059 55	1895	43 748 75	78,644 89
122,837 39	1896	44,485 85	74,253 50
130,311 17	1897	41,503 90	78,154 13
124,217 53	1898	41,042 90	76 185 81
128,723 69	1899	44,441 35	83,004 24
674 09	Residence.		
$873,587 56	Total outlay.		

Fees	$287,273 14	
Earnings	568,756 13	$568 756 13
Deficit	17,558 29	
Total of expenditures	$873 587 56	

Thus, had the fees and the income from endowment each been greater to the extent of one fiftieth of the actual receipts during the seven years, there would have been no deficit; alternatively, the same result would have arisen from a reduction to that extent of the expenditures, but as these have been stationary whilst the requirements of the University have been expanding in almost every direction, it may be that a further reduction of expenditure would have impaired the functions proper of the University.

The University College residence, from a financial point of view, has been disadvantageous for many years; premises, representing an investment of $100,000 of the endowment, have been set apart for the use of thirty undergraduates during a period, when in other directions even the smallest outlays have been carefully watched. During the past year the average attendance in residence fell to eighteen, with the result that the receipts were less than the housekeeping expenses to the extent of $674.09.

I have the honor to be, etc.,

W. H. CROSS,
Auditor.

TORONTO, 31st August, 1899.

APPENDIX 1.

BALANCE SHEET, 30TH JUNE 1899.

Funds.

General Endowments Fund, Schedule 1		$3,494,281 13
Specific Endowment Funds	" 2	78,771 08
Retirement Fund	" 3	40,645 80
Trust Funds	" 4	26 777 67
Revenue Reservations	" 5	25,048 67
		$3,665,524 35

ASSETS.

Site Lands, Buildings and contents, Schedule 6		$1,466,261 18
Unproductive Lands	" 7	1,004,569 88
Leased Property	" 8	454,931 07
Investments	" 9	738,341 10
Past due fees	" 10	1,421 12
		$3,665,524 35

SCHEDULE 1.

GENERAL ENDOWMENTS FUND.

Receipts from sale of frontage on Queen street avenue		$ 500 00
Re-sale of land in Seymour Township	$600 00	
Less due upon previous sale	460 00	
		140 00
Library Building:		
Capital expenditure upon erection of third tier of stacks (payment made from Library Insurance Fund)		5,769 72
Library Equipment:		
Value of additions to Library during 1898-9, as shown by accession catalogue	$7,041 41	
Less ratio of depreciation for year; 3 per cent. upon $123,451 84, and upon 1898 additions, $6,182.99	3,889 03	
		3,152 38
		$9,562 10

CONTRA.

Lot No. 22, College avenue, valued on July 1, 1892, as 28,655 superficial feet at	$33,165 00	
Leased upon frontage of 221 feet 3 inches, at a valuation of $100 per foot	22,125 00	
		$11,040 00
Decrease for year		$ 1,477 90
Fund of 30th June, 1898		3,495,759 03
Fund of 30th June, 1899		$3,494,281 13

SCHEDULE 2.

Specific Endowment Funds.

Scholarships.

Blake, Matriculation	$21,245 82	
Blake, Science and Moderns	3,750 00	
Moss, Classics	2,000 00	
Daniel Wilson, Natural Science	2,000 00	
William Mulock, Classics and Mathematics	2,000 00	
Mary Mulock, Classics	2,778 74	
George Brown, Modern Languages	1,128 34	
George Brown, Medical Science	5,391 72	
William Ramsay, Political Economy	1,009 42	
Julius Rossin, German	1,000 00	
Bankers, Political Science	1,200 00	
John Macdonald, Philosophy	2,030 00	
Physics	2,350 00	
Prince of Wales Prize, General Proficiency	950 00	
Mackenzie Memorial	17,584 60	
Fulton Bequest	3,291 30	
Starr Bequest	4,415 23	
Lyle Medal	155 83	
Stewart Bequest	1,250 36	
Young Memorial	3,239 72	
		$78,771 08
Return of 30th June, 1898	$78,047 77	
Interest appropriation	3,705 05	
Rent Starr farm	120 00	
	$81,872 82	
Scholarship payments 1898-9	3,101 74	
		$78,771 08

SCHEDULE 3.

Retirement Fund.

Beneficiaries 30th June, 1899.

James Loudon	$5 092 71	
Alfred Baker	2 761 24	
R. Ramsay Wright	2,761 24	
Maurice Hutton	2,761 24	
W. J. Alexander	2 761 24	
J. G. Hume	2,542 06	
J. F. McCurdy	2,005 59	
James Mavor	1,798 85	
J. E. Berkeley Smith	1,458 39	
G. M. Wrong	1,330 08	
A. B McCallum	1,272 45	
W. H. Fraser	1,272 45	
John Squair	1,272 45	
W. J. Loudon	1,033 58	
D. R. Keys	1,033 58	
W. H. Pike	968 81	
H. H. Langton	848 03	
John Fletcher	827 75	
W. S. Milner	628 22	
J. H. Cameron	628 22	
G. H. Needler	628 22	
W. L. Miller	628 01	
August Kirschmann	581 84	
James Brebner	536 75	
A. T. DeLury	513 30	
C. A. Chant	513 30	
E. C. Jeffrey	513 30	
Adam Carruthers	486 26	
J. C. McLennan	342 21	
Frederick J. Smale	248 30	
R. G. Murison	166 51	
G. W. Johnston	166 51	
R. R. Bensley	147 19	
P. Toews	115 92	
		$40,645 80
Fund of 30th June, 1898	$33,479 06	
Interest as per terms of Order in Council	2,113 61	
Contributions 1898 9	5,053 13	
		$40,645 80

SCHEDULE 4.

Trusts Accounts.

Residence Extension Fund		$ 878 92
Vice-Chancellor's Fund		624 06
Library Funds :		
Insurance	$23,304 41	
German	1 60	
Greek	30 00	
		23,336 01
Biological students' supply	627 29	
Langton Memorial	30 00	

Medical Faculty Funds :			
Pathological	$70 37		
Sanitary Science	28 46		
Gynæcological	50 00		
Materia Medica	57 56		
		206 39	
Donations, museum		1,075 00	
			$26,777 67
Return of 30th June, 1898		$36,596 73	
Interest Appropriation 1898-9		969 18	
Receipts during 1898-9		2,203 33	
		$39,769 24	
Payments during 1898-9		12,991 57	
			$26,777 67

SCHEDULE 5*a*.

Revenue Reservations.

Accrued income 30th June, 1896			$29,179 41
Contingent Fund			15,816 58
			$44,995 99

Suspense Account.

Expenditures upon grounds		$1,500 00	
Fire insurance premiums upon portions of current policies extending beyond 30th June, 1899		1,563 12	
			$3,063 12
			$41,932 87

Revenue Account.

Deficit on 30th June, 1898		$15,606 10	
Deficit on 1898-9 ordinary account		1,278 10	
			$16,884 20
			$25,048 67

SCHEDULE 5*b*.

Income Accrued but Not Due.

Accounts.	30th June, 1898.	30th June, 1899.
Debentures	$5,306 87	$5,633 21
Mortgages	7,260 76	6,933 99
Park rentals	4,197 91	4,515 25
School of Science	154 58	154 58
Business rentals	753 84	778 84
City of Toronto	1,500 00	1,500 00
Devonshire Place sales	82 80	82 80
Interest from other sales	121 71	73 24
	$19,378 47	$19,671 91
Agricultural fees	396 02	327 12
Other fees	73 00	94 00
	$19,847 49	$20,093 03

SCHEDULE 5c.

Revenue 1898-9.

Outlay.

Appropriations adopted 17th February, 1899 :			
Out of ordinary revenue	$123,215 10		
As interest upon special funds	7,256 06		
Supplementary appropriations	86 86		
		$130,558 02	
Less.			
Unused of original appropriations		1,834 33	
			$128,723 69

Income.

Account.	Estimate.	Actual.	
Interest :			
On purchase moneys	$ 556 46	$ 566 83	
On Loans	20,645 90	20,507 00	
On Debentures	12,226 95	11,896 87	
On advances to U. C. College	7,658 92	7,658 92	
Advances to Medical Faculty	69 50	69 50	
On Bank balances	300 00	552 87	
Rents :			
University Park	10,842 50	10,609 81	
Business properties	3,450 00	3,574 76	
School of Science	925 00	925 00	
Medical Faculty	1,900 00	1,900 00	
Board of Health	200 00	200 00	
City of Toronto payment	6,000 00	6,000 00	
Legislative grant	7,000 00	7,000 00	
Crown lands sold	8,000 00	8,191 81	
Mortgage transfer fees	40 00	25 50	
Sundry earnings, land	2,950 00	2,416 37	
Gymnasium fees	700 00	909 00	
University and College fees	42,000 00	44,441 35	
	$125,465 23		$127,445 59
Deficit 1898-9 ordinary account			$1,278 10

SCHEDULE 5*d*.

Revenue Expenditures 1898-9

Service.	Original Appropriations.	Supplementary Appropriations.	Unused.
Salaries	$94,525 50	$47 50	.....
Pensions	2,800 00	.....	.....
Examiners	2,900 00	.....	$101 13
Senate elections	625 00	.....	13 52
Convocation expenses	50 00	.....	25 00
President's office	250 00	.....	10 88
Bursar's office	750 00	.....	91 78
Registrar's office	50 00	.....	.....
Stationery, University	800 00	8 09	.....
" University College	75 00	.....	6 95
Printing, University	2,400 00	.....	108 29
" University College	75 00	.....	37 53
Advertising, University	100 00	.....	22 40
" University College	125 00	.....	54 45
Incidentals, University	100 00	11 80	.....
" University College	50 00	.....	4 44
" General	400 00	13 53	.....
Law costs	500 00	.....	17 79
Interest on Trust Funds	7,256 06	.....	468 22
Insurance	1,800 00	.....	.....
Telephones	135 00	.....	.....
Grounds	3,000 00	.....	40 03
Main building	3,125 00	.....	72 55
Library building	845 00	.....	182 14
Biological building	1,615 00	.....	3 96
Chemical building	1,045 00	.....	259 14
Gymnasium building	1,050 00	.....	129 56
Biological students' supplies	623 50	.....	.....
Biological department	650 00	49	.....
Chemical "	400 00	.....	123 75
Mineralogical "	426 10	.....	8 52
Physiological "	575 00	.....	.....
Physical "	700 00	.....	45
Philosophical "	300 00	5 45	.....
Political Science department	150 00	.....	.....
History "	20 00	.....	17 00
Classical "	20 00	.....	6 50
English "	100 00	.....	.....
French "	10 00	.....	9 25
German "	20 00	.....	11 00
Italian and Spanish "	10 00	.....	8 10
Oriental "	20 00	.....	.....
Original appropriations	$130,471 16		
Supplementary appropriations		$86 86	
Unused of appropriations			$1,834 33

SCHEDULE 6.

Site Lands, Buildings and Contents.

30th June, 1899.

Land set apart for the use of the University	$475,361 40	
Main building and residence	450,000 00	
Museum building	73,085 42	
Biological building	56,659 88	
Library building	110,015 65	
Chemical building	77,469 88	
Gymnasium building	36,288 46	
Y. M. C. A. Hall	1 00	
South Lodge	1,000 00	
		$1,279,881 69
Library proper	119 562 81	
Museum proper, fittings and biological apparatus	24,691 02	
Chemical apparatus	9,975 90	
Mineralogical and Geological apparatus	8,212 16	
Physical apparatus	15,900 00	
Psychological apparatus	1,800 00	
Mathematical apparatus	600 00	
		180,741 89
Main building furniture	3,841 20	
Residence furniture	1,796 40	
		5 637 60
		$1,466,261 18
Return of 30th June, 1898	1,457,339 08	
Additions to Library proper	3,152 38	
Addition to Library building	5,769 72	
		$1,466,261 18

SCHEDULE 7.

Unproductive Lands.

Hoskin Avenue and Devonshire Place survey	$152,268 74	
Block between North Drive and Devonshire Place	217,657 53	
Unsurveyed block east of North Drive	90,351 00	
Lots Nos. 51, 52, 54, 69, 70 and 71	91,273 50	
Lots Nos. 3, 6, 8 and 9 (College Avenue)	36,864 00	
Lots in Port Hope	7,100 00	
Lots near Belleville	1,820 00	
Indian Road property	7,421 60	
Farm lands	152 00	
College block, King street, Toronto	398,944 42	
Crawford street vacant lot	717 09	
		$1,004,569 88
Return of 30th June, 1898	$1,020,602 30	
Adelaide street asphalt pavement	1,278 66	
Interest on advances upon U. C. College block on King street	7,658 92	
	$1,029,539 88	

Payment by underwriters of main building of old U. C. College for damage by fire of 28th October, 1898	$ 8,685 00		
Transfer to leased lands account of remainder of lot 22, on College avenue	5,125 00		
Transfer to General Endowments fund, closing account of lot 22, on College avenue	11,040 00		
Indian Road land deposit, 29th April	100 00		
" " sale of material	20 00		
		24,970 00	
			$1,004,569 88

SCHEDULE 8.

Leased Lands.

Victoria College site		$ 1 00	
Wycliffe College site		2,500 00	
Observatory site		1 00	
School of Science site		18,500 00	
Land leased to the City of Toronto		120,000 00	
Park lands		188,605 00	
Toronto business properties		69,600 00	
Caradoc farm		2,000 00	
Valuation of lands			$401,207 00
St. George street property		$ 7,000 00	
Cumberland dwelling house		13,074 74	
Park Hospital building		24,799 51	
Expenditures on buildings upon park lands			44,874 25
Wycliffe College pavement			1,283 90
Park ground rents :—			
Past due		$ 617 25	
Accrued but not due		4,515 25	
City of Toronto payment		1,500 00	
School of Science accrued		154 58	
Other ground rents :—			
Past due		.....	
Accrued but not due		778 84	
			7,565 92
			$454,931 07
Return of 30th June, 1898		$442,231 30	
51 feet 3 inches frontage on College avenue, leased for 21 years		5,125 00	
Purchase of No. 59 St. George street, Toronto		7,000 00	
Expended upon residence portion of old Wycliffe College building, leased to Prof. Fletcher		607 30	
		$454,953 60	
Difference between yearly payments of $75 upon Wycliffe College pavement and $48.75 carried to revenue as interest	$26 25		
Decrease in rentals outstanding	6 28		
		32 53	
			$454,931 07

SCHEDULE 9.

Investments.

30th June, 1899.

Debentures and Municipal bonds	$277,619 94	
Interest past due	128 66	
Interest accrued, but not due	5,633 21	
		$283,381 81
Loans secured by mortgage upon real property	406,674 11	
Advanced as premium on fire policies	145 50	
Advanced to Medical Faculty	695 00	
Interest past due	2,536 18	
Interest accrued, but not due	6,933 99	
		416,984 78
Unpaid purchase money on land sales	22,610 64	
Interest accrued, but not due	57 40	
Earnings past due	156 04	
		22,824 08
Canadian Bank of Commerce, on deposit		15,150 43
		$738,341 10

1898-9 Transactions.

Inwards.

Debentures paid off	$ 9,094 29	
Loans re-paid	28,117 61	
Medical Faculty repayment	695 00	
Instalments of land sales received	1,485 90	
Decreased interest outstanding	1,139 27	
Withdrawn from Canadian Bank of Commerce	199,147 97	
		$239,680 04

Outwards.

Debentures purchased	$ 27,014 42	
Mortgage re-investments	30,302 21	
Land Sales unpaid for	140 00	
Increased fire premiums outstanding	11 80	
Deposited in the Canadian Bank of Commerce	175,100 30	
		$232,568 73
Decreased in value during 1898-9		$ 7,111 31
Return of 30th June, 1898		745,452 41
Return of 30th June, 1899		$738,341 10

SCHEDULE 10.

Fees.

Actual receipts during 1898-9		$44,489 25
Arrears of 1897-8 collected and included in the above receipts	$451 02	
Arrears of 1898-9	403 12	
		47 90
Fees of 1898-9 are thus		$44,441 35

1897-8 Arrears.

Collections during 1898-9 :—

Agriculture fees	$396 02	
Other fees	55 00	
Burglary loss	500 00	
		$ 951 02
Portion of one registration fee carried forward		18 00
Unpaid of burglary loss carried forward		1,000 00
Arrears of 30th June, 1898		$1,969 02

1898-9 Arrears.

Agriculture arrears 30th June, 1898	$396 02	
Nine degrees, 1898-9	90 00	
Examination outlays 1898-9	266 10	
	$752 12	
Received from department	425 00	
		$ 327 12
Portion of one registration fee, 1897-8, carried forward	18 00	
One registration fee, 1898-9	36 00	
Three dispensation fees, 1898-9	40 00	
		94 00
Burglary loss remaining to be repaid		1,000 00
Arrears of 30th June, 1899		$1,421 12

APPENDIX 2.

Fees Received 1898 9.

Faculty of Arts.

Subjects.	1st Year.	2nd Year.	3rd Year.	4th Year.	Miscellaneous.
	$ c.	$ c.	$ c.	$ c.	$ c.
College fees	4,580 00	3,739 00	3,677 00	4,479 00	75 00
Penalties	26 00	16 00	15 00	53 00	
Dispensations	100 00	60 00	70 00	75 00	10 00
Honor Certificates		1 00	2 00	5 00	64 00
Matriculation	52 00				533 00
Ad Eundem	10 00	10 00	10 00	10 00	10 00
Examination	2,482 00	2,551 00	2,360 00	2,682 00	945 00
Degrees				1.540 00	240 00
Chemical supply	14 00	65 00	59 00	10 00	
Mineralogical supply		14 00	15 00	20 00	
Biological "	24 50	55 00	130 00	225 00	
Physical "	51 00	74 00	183 50	107 00	
Psychological "			26 00	45 00	
Library	290 00	276 00	272 00	314 00	2 00
Medical Students:					
Matriculation	50 00	15 00	2 00		
Ad Eundem		10 00			
Honor Certificate				2 00	
Examination	600 00	570 00	140 00	550 00	100 00
Degrees				980 00	20 00
Chemical supply	174 00	132 00	3 00		
Biological "	88 50	121 00	2 75		
Instruction to Medical Faculty in Arts Subjects	840 00	675 00			
Instruction to Practical Science Students	837 00	442 00	72 00		
Totals	10,219 00	8,826 00	7,039 25	11,097 00	1,999 00

APPENDIX 2—*Continued.*

Departmental Fees.

Subject.	Law.	Dentistry.	Engineering and Applied Science.	Music.	Pharmacy.	Pedagogy.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Matriculation	40 00	350 00	.....	30 00	310 00	.....
Examination	60 00	990 00	60 00	30 00	620 00	250 00
Practical Examination	.....	.....	.....	.....	124 00	.....
Degrees	80 00	1,170 00	60 00	60 00	620 00	30 00
Totals	180 00	2,510 00	120 00	120 00	1,674 00	280 00

Classification of Fees Paid.

First year	$10,219 00	
Second year	8 826 00	
Third year	7,039 25	
Fourth year	11,097 00	
Miscellaneous	1,999 00	
Law	180 00	
Dentistry	2,510 00	
Engineering	120 00	
Music	120 00	
Pharmacy	1,674 00	
Pedagogy	280 00	
Agricultural	425 00	
		$44,489 25

Classification of Services.

College fees	$16,550 00
Penalties	110 00
Dispensations	315 00
Honor Certificates	74 00
Matriculation	1,382 00
Ad Eundem	60 00
Examination	14,990 00
Practical Examination	124 00
Degrees	4,800 00
Chemical supply	457 00
Mineralogical supply	49 00
Biological "	646 75
Physical "	415 50
Psychological "	71 00
Library	1,154 00
Instruction to Medical Faculty, Arts subjects	1,515 00
Instruction to Practical Science Students	1,351 00
Agriculture, payment by Government	425 00
	$44,489 25

APPENDIX 3.

Medical Faculty Fees.

First year	$6,290 00		
Less Arts portion	840 00		
		$5,450 00	
Second year	$4,770 00		
Less Arts portion	675 00		
		4,095 09	
Third year		4,615 00	
Fourth year		4,365 00	
Miscellaneous fees		1,113 00	
Registration fees		345 00	
Summer Session fees		120 00	
Psychological fees (collected for Dr. Daniel Clark)		245 00	
Interest on bank account		195 67	
Collections during 1898-9			$20,543 67

Contra.

Salaries:			
Professors and Associate Professors	$9,636 74		
Lecturers and Instructors	918 18		
Demonstrators and Asst. Demonstrators.	1,250 00		
		$11,804 92	
Summer Session services		120 00	
Honorarium to Dr. Richardson		250 00	
Psychological fees paid over to Dr. Clark		245 00	
Wages of attendants		1,140 00	
Rentals:			
Biological building	$1,900 00		
Gerrard street building	1,000 00		
		2,900 00	
Interest on University advance for repairs, 5% on $1,390	$ 69 50		
Re-payment on account of advance (leaving $695 still to be re-paid)	695 00		
		764 50	
Working expenses		3,319 25	
			$20,543 67
Arrears on 30th June, 1898	$225 00		
Collected and included in above	55 00		
Arrears of 1897 8 unpaid	$170 00		
Portion of third year, 1898-9, unpaid	55 00		
Arrears 30th June, 1899	$225 00		

APPENDIX 4.

University College Residence, 1898-9.

Income.

Rent	$ 484 05	
Board	2,027 00	
Steward's sundries	100 05	
Fuel	35 45	
Detriments	10 70	
Fines	11 80	
		$2,069 05

Expenditures.

Provisions	$2,088 54	
Fuel	304 89	
Gas	203 67	
Maintenance and utensils	115 70	
Laundry	23 73	
Steward's wages	360 00	
Other wages	455 58	
Allowance to Dean	200 00	
	$3,752 11	
Less paid on account 1897 8	237 61	
		3,541 50
Deficit for the year		$845 45

Surplus 1897-8, assuming liabilities to be equal to those of the preceding year		$403 01
From estimated liabilities	$80 00	
Deduct irrecoverable accounts	74 04	
		5 96
		$ 408 97
Expenditures 1898-9	$3,752 11	
Income 1898-9	2,669 05	
		1,083 06
Final deficit		$674 09

UNIVERSITY OF TORONTO.

REPORT

OF

STANDING COMMITTEE ON FINANCE.

1899-1900.

(ADOPTED MARCH 9, 1900.)

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO.

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1900.

UNIVERSITY OF TORONTO.

REPORT

OF THE

STANDING COMMITTEE ON FINANCE.

TORONTO, March 1, 1900.

The Standing Finance Committee beg to submit their report for the year ending 30th June, 1900.

1. They have obtained from the Bursar the estimates of the receipts on income account for the year; and from the Bursar and the heads of University departments they have received estimates of probable expenditures for the year.

2. They also incorporate in their report, for the sake of convenience, the estimates of University College, which have been furnished to the Committee for their information by the Council of University College.

3. The forms of account which were employed in last year's report have been adhered to, and for the purpose of comparison the actual results of the transactions of the year 1898-9 are given.

ESTIMATED REVENUE, YEAR 1899-1900.

Account.	Estimate, 1899-1900.	Receipts, 1898-1899.
Interest on purchase moneys	508 21	566 83
Interest on loans	20,740 37	20,507 00
Interest on debentures	11,618 41	11,896 87
Interest on advances to Medical Faculty	34 75	69 50
Rents, University Park	11,232 50	10,709 81
Rents, business properties	3,475 00	3,474 76
Rents, miscellaneous:		
(1) School of Science	925 00	925 00
(2) Medical Faculty, West wing Biological Building	1,900 00	1,900 00
(3) Provincial Board of Health, "	200 00	200 00
City of Toronto, payment *re* Park	6,000 00	6,000 00
Legislative grant	7,000 00	7,000 00
Wild lands sales	3,600 00	8,191 81
Sundry earnings, land	2,000 00	2,416 37
Interest on advances to U.C. College	7,670 81	7,658 92
Interest on bank balances	350 00	552 87
University and College fees	42,000 00	44,441 35
Gymnasium fees	900 00	909 00
Transfer fees (discharge of mortgage, etc.)	25 00	25 50
	$120,180 05	$127,445 59

Deductions.

Interest on the following Special Funds.

Account.	Amount of balance at 30 June, 1899.	Amount of interest.
(*a*) Library Insurance Fund (books)	23,304 41	699 13
(*b*) Residence Extension Fund	878 92	26 36
(*c*) Vice-Chancellor's Special Account	624 06	18 72
(*d*) Retirement Fund	40,645 80	2,438 74
(*e*) Specific Endowments (Scholarships, etc.)	74,355 85	4,174 39
	$139,809 04	$7,357 34
Estimated revenue	120,180 05	
Deductions as above	7,357 34	
	$112,822 71	
Deficit on Revenue Account at 30th June, 1899, brought forward	$16,884 20	

REMARKS.

1. The deficit estimated for 1898-9, as shown by the last report of the Finance Committee, was $5,005.93, and the actual deficit was $1,278.10.

2. The Committee have examined with minute care the various items in the estimate for 1899-1900, and believe that no further economies are possible.

3. The Committee regret that the deficit for the current year is estimated at $14,221.54, without taking into consideration the unpaid interest on advance to Upper Canada College.

B. E. WALKER,
Chairman.

Summary of Estimated Expenditure, Year 1899-1900.

	Payable out of interest on special funds.	Payable out of ordinary revenue.	Expenditure 1898-9.
	$ c.	$ c.	$ c.
1. Salaries and Pensions:			
(*a*) Salaries (inclusive of Bursar's Office and Retirement Fund)		95,107 50	94,573 00
(*b*) Pensions		2,800 00	2,800 00
2. Bursar's Office, exclusive of salaries		750 00	658 22
3. Expenses *re* investments, etc		900 00	895 74
4. Scholarships and Fellowships	4,057 50		3,101 74
5. Examiners		2,900 00	2,798 87
6. Insurance		1,800 00	1,800 00
7. Telephones		135 00	135 00
8. Library:			
Grant from Library Insurance Fund (Capital)	3,400 00		5,938 33
Customary grant		2,600 00	
Maintenance		825 00	662 86
9. Main Building:			
(*a*) Repairs, maintenance of structure, fuel, water, gas, etc		3,125 00	3,052 45
(*b*) President's Office		250 00	239 12
(*c*) Registrar's Office		50 00	50 00
10. Grounds		3,000 00	2,959 97
11. Chemical Department:			
(*a*) Maintenance of structure		1,045 00	785 86
(*b*) Maintenance of department		400 00	276 25
12. Biological Department:			
Maintenance of structure, fuel, water, gas, etc		1,540 00	1,611 04
Laboratory supplies		300 00	650 49
Museum supplies		350 00	
Students' supplies		646 75	623 50
Marine laboratory		200 00	
13. Physiological Department:			
Maintenance		200 00	575 00
Apparatus		275 00	
14. Physical Department:			
Maintenance		600 00	699 55
Apparatus		1,200 00	
15. Mineralogical and Geological Department:			
Maintenance		200 00	191 48
Minerals			226 10
16. Psychological Department—Maintenance		300 00	305 45
17. Mathematical Department		40 00	
18. Political Science Department—Class Room supplies			
Books		150 00	150 00
19. History—Class Room supplies		20 00	3 00
20. Classics "		30 00	13 50
21. English "		100 00	100 00
22. French "		10 00	75
23. German "		30 00	9 00
24. Italian and Spanish—Class Room supplies		20 00	1 90
25. Oriental Literature		20 00	20 00
26. Stationery—University		800 00	808 09
27. Printing "		2,400 00	2,291 71
28. Advertising "		200 00	77 60
29. Incidentals "		100 00	111 80
30. Stationery—University College		75 00	68 05
31. Printing "		75 00	37 41
32. Advertising "		125 00	70 55
33. Incidentals "		50 00	45 56
34. Convocation expenses		50 00	25 00
35. Senate elections			611 48
36. Gymnasium—Maintenance		1,250 00	920 44
	7,457 50	127,044 25	130,975 86
Total estimated expenditure out of ordinary income			127,044 25
Total available income (p. 5)			112,822 71
Deficit			14,221 54

Detailed Estimate of Expenditure, Year 1899-1900.

Salaries.	Estimated amount, year ending 30th June, 1900.	Amount paid year ending 30th June, 1899.
	$ c.	$ c.
1. Bursar's Office:		
Bursar	1,600 00	1,600 00
Accountant	1,000 00	1,000 00
	2,600 00	2,600 00
2. Library:		
Librarian (salary at $1,900, for six months, $950; at $2,000 for six months, $1,000)	1,950 00	1,850 00
First Assistant	500 00	500 00
Second Assistant	387 50	325 00
Third Assistant (four summer months at $25)	100 00	100 00
Delivery Clerk (salary at $40 per month for eight month)	320 00	320 00
Delivery Clerk (salary at $10 per month for eight months)	80 00	80 50
Caretaker (salary at $500 for three months)	450 00	125 00
" (salary at $450 for nine months)		337 00
	3,787 50	3,637 50
3. General as between University and University College:		
President (also paid as Professor of Physics)	1,800 00	1,800 00
Janitor (salary at $480 for three months, $120; at $540 for nine months, $405)	525 00	462 50
Gardener	480 00	385 00
Engineer (with rooms and fuel)	576 00	576 00
Fireman (salary at $35 per month for eight months)	280 00	280 00
Carpenter	540 00	517 50
Cleaner of buildings	360 00	348 00
	4,561 00	4,369 00
4. Pensions:		
E. J. Chapman	1,800 00	1,800 00
J. M. Hirschfelder	1,000 00	1,000 00
	2,800 00	2,800 00
5. University of Toronto, general:		
Vice-Chancellor		
Registrar	1,500 00	1,500 00
Registrar's Assistant (also paid as Lecturer in Greek)	200 00	200 00
Bedel and attendant on Senate	800 00	800 00
Architect	100 00	100 00
	2,600 00	2,600 00
6. Teaching staff, etc., University of Toronto:		
(*a*) Modern History and Ethnology:		
Professor (salary at $2,900 for three months, $725; at $3,000 for nine months, $2,250)	2,975 00	2,875 00
	2,975 00	2,875 00
(*b*) Political Science:		
Professor (salary at $3,100, for three months, $775; at $3,200, for nine months, $2,400)	3,175 00	3,075 00
Professor of Constitutional and International Law	1,000 00	1,000 00
Professor of Roman Law, Jurisprudence and History of English Law	600 00	1,000 00
Instructor (Fellow 1898-99)	600 00	500 00
	5,375 00	5,575 00

DETAILED ESTIMATE OF EXPENDITURE, YEAR 1899-1900 —*Continued*

Salaries.	Estimated amount year ending 30th June, 1900.	Amount paid year ending 30th June, 1899.
Teaching staff, etc., University of Toronto.—*Continued.*		
(*c*) Mathematics:		
Professor	3,200 00	3,200 00
Lecturer (salary at $1,600 for three months, $400; at $1,700 for nine months, $1,275)	1,675 00	1,575 00
Fellow	500 00	500 00
	5,375 00	5,275 00
(*d*) Physics:		
Professor	3,200 00	3,200 00
Demonstrator	1,800 00	1,800 00
Lecturer (salary at $1,600 for three months, $400; at $1,700 for nine months, $1,275)	1,675 00	1,575 00
Demonstrator	1,100 00	1,000 00
Mechanical Assistant	1,000 00	1,000 00
Lecture Assistant	400 00	.....
	9,175 00	8,575 00
(*e*) Chemistry:	.....	3,200 00
Professor		
Demonstrator (salary at $1,700 for three months, $425; at $1,800 for nine months, $1,350)	1,775 00	1,675 00
Demonstrator (additional for session)	600 00	.....
Lecturer	.....	1,275 00
Lecture Assistant	500 00	500 00
" (additional for session)	300 00	.....
Assistant	500 00	500 00
" (additional for session)	480 00	.....
Attendant	504 00	504 00
Cleaner	120 00	157 50
	4,729 00	7,811 50
(*f*) Mineralogy and Geology:	500 00	500 00
Professor (Acting)	700 00	600 00
Instructor	200 00	200 00
Attendant	1,400 00	1,300 00
(*g*) Biology:		
Professor	3,200 00	3,200 00
Associate Professor of Physiology (salary at $2,400 for three months, $600; at $2,500 for nine months, $1,875)	2,475 00	2,375 00
Lecturer (salary at $1,600 for three months, $400; at $1,700 for nine months, $1,275)	1,675 00	1,575 00
Demonstrator	1,100 00	1,000 00
Fellow	500 00	500 00
Temporary Assistant in Botany	150 00	.....
" Zoology	275 00	.....
" "	125 00	.....
Sub-Curator of Museum	750 00	750 00
Attendant and Caretaker	500 00	500 00
Boy Cleaner	180 00	180 00
Special services during session	100 00	.....
	11,030 00	10,080 00
(*h*) Italian and Spanish:		
Associate Professor (salary at $2,400 for three months, $600; at $2,500 for nine months, $1,875)	2,475 00	2,375 00
Instructor in Italian	400 00	350 00
Instructor in Spanish	50 00	50 00
	2,925 00	2,775 00

Detailed Estimate of Expenditure, Year 1899-1900.

Salaries.	Estimated amount year ending 30th June, 1900.	Amount paid year ending 30th June, 1899.
6. Teaching staff, etc., University of Toronto.—*Continued.*		
(*i*) Logic and Metaphysics:		
Associate Professor of Philosophy, etc	1,800 00	1,800 00
Lecturer in Philosophy (salary at $1,200 for three months, $300; at $1,300 for nine months, $975)	1,275 00	1,175 00
Instructor and Laboratory Assistant	600 00	500 00
	3,675 00	3,475 00
7. Teaching staff, University College:		
(*k*) Ethics:		
Professor	3,200 00	3,200 00
	3,200 00	3,200 00
(*l*) Greek:		
Professor	3,200 00	3,200 00
Lecturer (salary at $1,500 for three months, $375; at $1,600 for nine months, $1,200)	1,575 00	1,475 00
	4,775 00	4,675 00
(*m*) Latin:		
Professor (salary at $2,800 for three months, $700; at $2,900 for nine months, $2,175)	2,875 00	2,775 00
Lecturer (salary at $1,700 for three months, $425; at $1,800 for nine months, $1,550)	1,775 00	1,675 00
Lecturer (salary at $1,200 for three months, $300, at $1,300 for nine months, $975)	1,275 00	1,175 00
	5,925 00	5,625 00
(*n*) Oriental Literature:		
Professor (salary at $3,100 for three months, $775; at $3,200 for nine months, $2,400)	3,175 00	3,075 00
Lecturer (salary at $1,200 for three months, $300; at $1,300 for nine months, $975)	1,275 00	1,175 00
	4,450 00	4,250 00
(*o*) English:		
Professor	3,200 00	3,200 00
Lecturer	1,800 00	1,800 00
	5,000 00	5,000 00
(*p*) French:		
Associate Professor (salary at $2,400 for three months, $600; at $2,500 for nine months, $1,875)	2,475 00	2,375 00
Lecturer (salary at $1,500 for three months, $425; at $1,800 for nine months, $1,350)	1,775 00	1,675 00
Instructor	600 00	500 00
	4,850 00	4,550 00
(*q*) German:		
Associate Professor	2,500 00	2,475 00
Lecturer (salary at $1,700 for three months, $425; at $1,800 for nine months, $1,350)	1,775 00	1,675 00
Instructor (salary at $900 for three months, $225; at $1,000 for nine months, $750)	975 00	875 00
	5,250 00	5,025 00
8. Gymnasium:		
Secretary	150 00	.....
Instructor	800 00	800 00
Caretaker	500 00	500 00
	1,450 00	1,300 00

Detailed Estimate of Expenditure, Year 1899 1900.—*Continued.*

Expenses.	Payable out of interest on special funds.	Paid out of ordinary revenue.	Amount paid 1898-9
	$ c.	$ c.	$ c.
2. Bursar's office :			
Stationary, printing, postage and incidentals		450 00	358 22
Auditor		300 00	300 00
		750 00	658 22
3. Expenses *re* investments, etc. :			
(*a*) Law costs		450 00	482 21
(*b*) General incidentals (including commission on loans)		450 00	413 53
		900 00	895 74
4. Scholarships and Fellowships :			
(*a*) Scholarships :			
Junior Matriculation :			
1. Prince of Wales	50 00		50 00
Edward Blake Scholarship :			
1*a*. General Proficiency	60 00		60 00
2. "	42 50		42 50
3. "	25 00		
4. "	22 50		22 50
5. "	20 00		20 00
6 "	17 50		
7. "	15 00		15 00
8. " West Durham	25 00		25 00
1. Classics and Mathematics	60 00		60 00
2. "	20 00		20 00
1. Classics and Moderns	60 00		60 00
2. "	42 50		42 50
3. "	20 00		20 00
4. "	17 50		17 50
1 Mathematics and Moderns	60 00		60 00
2. "	20 00		
1. Mathematics and Science	60 00		60 00
2. "	20 00		20 00
1. Moderns and Science	60 00		60 00
2. "	20 00		
1. Mathematics	60 00		60 00
2. "	15 00		15 00
1. Moderns	60 00		60 00
2. "	15 00		15 00
1. Science	60 00		60 00
2. "	15 00		
1. Classics—Mary Mulock	60 00		60 00
2. " "	60 00		
First Year :			
Classics (Moss Scholarship)	60 00		60 00
Modern Languages (Blake Scholarship)	60 00		60 00
Mathematics and Physics (Fulton Scholarship)	60 00		60 00
Natural Science (Fulton Scholarship)	60 00		60 00
Chemistry and Mineralogy } (Fulton Scho'rship)	30 00		60 00
Chemistry and Physics }	30 00		
Political Science (Banker's Scholarship)	70 00		70 00
Second Year :			
Classics (William Mulock Scholarship)	60 00		60 00
Modern Languages (George Brown Scholarship)	60 00		60 00
Political Science (Alexander Mackenzie Scholarship) No. 1	75 00		75 00
Political Science (Alexander Mackenzie Scholarship No. 2	50 00		50 00
Philosophy (John Macdonald Scholarship)	50 00		50 00
" (Special Award)			25 00

DETAILED ESTIMATE OF EXPENDITURE, YEAR 1899-1900—*Continued.*

Expenses.	Payable out of interest on special funds.	Paid out of ordinary revenue.	Amount paid 1898-9.
Scholarships.—*Continued.*			
Second Year:	$ c.	$ c.	$ c.
Mathematics and Physics (William Mulock Scholarship)	60 00		60 00
Natural Science (Blake Scholarship)	60 00		60 00
Chemistry and Mineralogy (Blake Scholarship).	60 00		60 00
Chemistry and Physics (Blake Scholarship)	60 00		60 00
Third Year:			
Classics	60 00		60 00
Modern Languages (Julius Rossin Scholarship).	60 00		60 00
Ethics (John Macdonald Scholarship)	50 00		50 00
Political Science (Alexander Mackenzie Scholarship) No. 1	75 00		75 00
Political Science (Alexander Mackenzie Scholarship) No. 2	50 00		50 00
Mathematics and Physics (A. A. A. S. Scholarship)	75 00		75 00
Natural Science (Daniel Wilson Scholarship):			
Div. I	30 00		30 00
Div. II.	30 00		30 00
Chemistry and Mineralogy (Daniel Wilson Scholarship)	60 00		
Chemistry and Physics (A.A.A.S. Scholarship).	70 00		
Post Graduate:			
Political Science (Ramsay Scholarship)	60 00		
Philosophy (George Paxton Young Memorial Scholarship)	400 00		
Medicine (Brown Memorial Scholarship)	300 00		300 00
(*b*) Graduate Fellowship:			
Alexander Mackenzie Graduate Fellowship in Political Science	375 00		125 00
Alexander Mackenzie Graduate Fellowship in Political Science	375 00		375 00
	4,057 50		3,101 74
5. Examiners:			
Arts		600 00	565 20
Medicine		750 00	739 45
Law		80 00	80 00
Engineering and Applied Science		100 00	80 00
Dentistry		450 00	438 50
Agriculture		280 00	266 10
Music		40 00	40 00
Pharmacy		425 00	419 62
Pedagogy		100 00	80 75
Matriculation		75 00	89 25
		2,900 00	2,798 87
6. Insurance:			
For three years, $5,400.00. Proportion charged to revenue of 1899-1900		1,800 00	1,800 00
		1,800 00	1,800 00
7. Telephones:			
University (main building)		45 00	45 00
Library		45 00	45 00
Bursar's office		45 00	45 00
		135 00	135 00

DETAILED ESTIMATE OF EXPENDITURE, YEAR 1899-1900.— *Continued.*

Expenses.	Payable out of interest on special funds.	Payable out of ordinary revenue.	Amount paid 1898-9.
	c.	$ c.	$ c.
8. Library (exclusive of salaries):			
From Library Insurance Fund Capital	3,400 00		5,938 33
Customary grant		2,600 00	
Maintenance: Fuel		350 00	529 42
Water		25 00	23 79
Cleaning		200 00	210 00
Repairs and incidentals		250 00	99 65
9. Main building:	3,400 00	3,425 00	6,601 19
(*a*) Maintenance—Repairs (carpentry, plumbing and sundries)		1,200 00	1,352 52
Fuel		1,560 00	1,373 39
Water		225 00	193 52
Gas		200 00	133 02
(*b*) President's office		250 00	239 12
(*c*) Registrar's office		50 00	50 00
		3,425 00	3,341 57
10. Grounds:			
(*a*) Labor, tools, etc		2,500 00	2,959 97
(*b*) Part of cost of new roads, sidewalks, etc		500 00	
		3,000 00	2 959 97
11. Chemical Department:			
(*a*) Maintenance of Structure—Fuel		450 00	461 17
Gas and electric light		120 00	122 14
Water		75 00	65 92
Cleaning		75 00	136 63
Repairs and incidentals		325 00	
		1,045 00	785 86
(*b*) Maintenance of Department—Chemicals, etc		400 00	276 25
		400 00	276 25
12. Biological Buildings: Maintenance of structure—			
Fuel		700 00	722 69
Gas and electric light		200 00	162 14
Water		160 00	113 18
House furnishings and cleaning materials		50 00	143 44
Repairs, including carpentry and plumbing		200 00	228 84
Additional attendance and cleaning assistance (exclusive of mineralogical and anatomical rooms)		230 00	240 75
		1,540 00	1,611 04
Biological Department:			
Laboratory and lecture room supplies		300 00	650 49
Museum supplies		350 00	
Students' laboratory supplies		646 75	623 50
Marine laboratory		200 00	
		1,496 75	1,273 99
13. Physiological Department:			
Maintenance, etc		200 00	575 00
Apparatus		275 00	
		475 00	575 00
14. Physical Department:			
Maintenance—Supplies		600 00	699 55
Apparatus		1,200 00	
		1,800 00	699 55
15. Mineralogical and Geological Department:			
Supplies and sundries, including students' supplies		200 00	191 48
Minerals (addition to Ferrier collection)			226 10
		200 00	417 58

Detailed Estimate of Expenditure, Year 1899-1900.—*Concluded*

Expenses.	Payable out of ordinary revenue.	Amount paid 1898-9.
	$ c.	$ c.
16. Psychological Department :		
Maintenance	300 00	305 45
17. Mathematics	40 00	.....
18. Political Science :		
Class room supplies	25 00	150 00
Books for departmental Library	125 00	
19. History :		
Class room supplies	20 00	3 00
20. Classics :		
Latin—Class room supplies	30 00	13 50
21. English :		
Class room supplies and provision for reading of essays	100 00	100 00
22. French :		
Books for class room use	10 00	75
23. German :		
Class room supplies	30 00	9 00
24. Italian and Spanish :		
Books for class room use	20 00	1 90
25. Oriental Literature :		
Books for class room use	20 00	20 00
26. Stationery (University) :		
Office supplies, paper for examinations, postage, etc.	800 00	808 09
27. Printing (University)	2,400 00	2,291 71
28. Advertising (University)	200 00	77 60
29. Incidentals (University)	100 00	111 80
30. Stationery (University College)	75 00	68 05
31. Printing (University College)	75 00	37 41
32. Advertising (University College)	125 00	70 55
33. Incidentals (University College)	50 00	45 56
34. Convocation expenses	50 00	25 00
35. Senate elections :		
Allowance to the scrutineers and assistants	.....	220 00
Postage, printing and incidentals	.....	391 48
		611 48
36. Gymnasium and Students' Union :		
Fuel	250 00	230 06
Water	100 00	109 56
Gas	100 00	79 11
Cleaning	100 00	262 31
Repairs and incidentals	300 00	
Apparatus, labor, etc	400 00	239 40
	1,250 00	920 44

TORONTO, March 1st, 1900.

JAMES BREBNER, ESQ., B.A.,
Registrar, University of Toronto.

DEAR SIR,—At a meeting of the Board of Trustees, held to-day, the draft Report of the Council of University College and of the Committee of the Senate on Finance, containing estimates of revenue and expenditure, was read, and, on motion of Mr. Walker, the details of the Report were approved with this observation, that the attention of the Government should be drawn to the fact that the income is insufficient to defray the estimated expenditure.

Yours truly,

J. E. BERKELEY SMITH,
Bursar.

TWENTY-FIFTH ANNUAL REPORT

OF THE

ONTARIO AGRICULTURAL COLLEGE

AND

EXPERIMENTAL FARM

1899.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

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1900.

TWENTY-FIFTH ANNUAL REPORT

OF THE

ONTARIO AGRICULTURAL COLLEGE

AND

EXPERIMENTAL FARM

FOR THE YEAR 1899.

GUELPH, December 30th, 1899.

To the Honorable JOHN DRYDEN,
Minister of Agriculture:

SIR,—I have the honor to transmit herewith the Twenty-fifth Annual Report of the Ontario Agricultural College and Experimental Farm.

In this Report the work of the year 1899 has been briefly reviewed under the following heads:

PART I. REPORT OF PRESIDENT.
PART II. REPORT OF RESIDENT AND ENGLISH MASTER.
PART III. REPORT OF PROFESSOR OF PHYSICS AND LECTURER IN ENGLISH.
PART IV. REPORT OF PROFESSOR OF BIOLOGY AND GEOLOGY.
PART V. REPORT OF PROFESSOR OF CHEMISTRY.
PART VI. REPORT OF PROFESSOR OF VETERINARY SCIENCE.
PART VII. REPORT OF PROFESSOR OF DAIRYING.
PART VIII. REPORT OF PROFESSOR OF AGRICULTURE AND FARM SUPERINTENDENT.
PART IX. REPORT OF PROFESSOR OF HORTICULTURE.
PART X. REPORT OF FELLOW IN BACTERIOLOGY.
PART XI. REPORT OF EXPERIMENTALIST.
PART XII. REPORT OF MANAGER OF POULTRY DEPARTMENT.
PART XIII. REPORT OF LECTURER ON APICULTURE.
PART XIV. REPORT OF PHYSICIAN.

I have the honor to be, Sir,
Your obedient servant,

JAMES MILLS,
President.

THE ONTARIO AGRICULTURAL COLLEGE

AND

EXPERIMENTAL FARM

GUELPH, ONTARIO.

HON. JOHN DRYDEN, Toronto, Ont.
Minister of Agriculture.

James Mills, M.A., LL.D.	President
A. E. Shuttleworth, B.A.Sc., Ph.D.	Professor of Chemistry
H. H. Dean, B.S.A.	Professor of Dairy Husbandry
J. Hugo Reed, V.S	Professor of Veterinary Science
J. B. Reynolds, B.A.	Professor of Physics and Lecturer in English
C. A. Zavitz, B.S.A.	Experimentalist
Wm. Lochhead, B.A., M.S	Professor of Biology and Geology
G. E. Day, B.S.A.	Professor of Agriculture and Farm Superintendent
H. L. Hutt, B.S.A.	Professor of Horticulture
F. C. Harrison, B.S.A. (who has charge of Library)	Professor of Bacteriology
R. Harcourt, B.S.A.	Assistant Chemist
M. W. Doherty, B.S.A., M.A.	Assistant in Biology
I. N. Beckstedt, B.A.	Assistant Resident Master
M. N. Ross, B.S.A.	Fellow in Biology
W. J. Price, B.S.A.	Fellow in Agriculture
A. T. Wiancko, B.S.A.	Assistant Librarian
W. R. Graham, B.S.A.	Manager and Lecturer in Poultry Department
H. R. Rowsom	Lecturer in Apiculture
Captain Walter Clarke	Instructor in Drill and Gymnastics
W. O. Stewart, M.D.	Physician
G. A. Putnam	Stenographer
A. McCallum	Bursar

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PART I.

REPORT OF THE PRESIDENT

PRACTICAL EDUCATION.

Before proceeding to report on the special lines of work in which we are engaged, I wish to express in a word my gratification at the rapidly increasing interest which the people of this Province, and I might say of the Dominion, are taking n the subject of *practical* education,—domestic, industrial, and technical. After long and varied experience of scholastic and academic methods, the people are beginning to realize, as President Eliot of Harvard has said, that function and environment should ultimately determine education—that courses of study and methods of training should have reference to the work and surroundings of after-life, and should vary accordingly. Public opinion in this Province has not yet formulated the changes which it desires in the substance and methods of Canadian education; but it has resolutely come to the conclusion that, for economic and other reasons, it would be a mistake to go on educating the rank and file of our boys and girls, from five to sixteen or eighteen years of age, without any direct reference to the domestic duties or principal industries of the Canadian people.

During the past generation we have made rapid progress in education. We have spent large sums of money on schools and colleges, have raised the standard of qualification for teachers, and have endeavored to improve our methods. No doubt we have made real progress, on which we have congratulated ourselves from time to time; but as the scholastic ideal has become more difficult to reach and the scholastic demands on time have increased, our education has drifted farther and farther from the practical realities of every-day life. Of our girls especially, it may be truthfully said that we are educating them as if they were all destined to be teachers or ladies of leisure, with servants to wait on them and do their bidding from the day they leave school.

At length, however, a reaction has set in and we have a strong and rapidly growing demand for a more practical education in all classes of schools,—simple lessons in nature study and practical talks on housekeeping, with a thorough training in sewing, patching, darning, etc., in the public schools; more advanced lessons in nature study, a good course on domestic science, and continued practice in needlework, with suitable instruction in cutting and fitting simple garments in the high schools; and ample provision for manual training and technical education in all the larger centres of population.

These are some of the things which the people of this country need and are beginning to demand. The call has gone forth and the leaders of public opinion are beginning to move. Note the generous action of Sir William McDonald, of Montreal, in starting sample manual training schools in the different provinces of the Dominion, and the speeches of the Hon. G. W. Ross on technical education before the Board of Trade in Toronto and on domestic economy at the opening of the Institute of Domestic Science in Hamilton. Note also the reference to technical education in the speech of the mover of the address in reply to the speech from the throne in our Legislative Assembly a few days ago. We are pleased to see the demand and the first indications of response; and we hope soon to see the stately stepping of some one who is progressive enough, wise enough, and strong enough to crystalize into legal enactments the will of the people in this matter.

Work at the College.

The work at the College has gone on as usual during the past year, nothing specially noteworthy having occurred. Good work has been done in the different departments; and unbounded confidence in the growth and prosperity of the College has been noticed in the institution, among the ex students, and in a rapidly widening circle outside.

The usual number of excursionists under the auspices of the Farmers' Institutes (about 30,000) visited the College in the month of June—a result due, no doubt, to the increasing interest of the farmers in the work of the College, and to the well-known fact that they are made welcome and waited upon by the officers of the institution.

At the meeting of the Experimental Union in December, the 25th anniversary of the College was celebrated with pride and enthusiasm by officers, students, ex-students, and a number of visitors. The President reviewed the history of the College from the beginning to the present time, and a number of prominent men delivered appropriate addresses, including John I. Hobson, Esq., Chairman of the College Board ; Hon. Sheriff Drury, ex-Minister of Agriculture ; C. C. James, Deputy Minister of Agriculture ; and Prof. Robertson, Commissioner of Agriculture for the Dominion. The President's address (which appeared in *The Farmer's Advocate* of the 1st December, 1899) will be found in the report of the Experimental Union for the year.

Attendance of Students.

The attendance of students during the past year has been the largest in the history of the College. In fact, it has been considerably larger than can be accommodated in the present buildings,—237 having registered in the regular course and 129 in the dairy course, or a total of 366. One hundred and three new students have entered for the regular course since the beginning of the present session in September, and the total number in this course has been fifty one in excess of the present dormitory accommodation.

Ages and Religious Denominations.

The limits in age and the average happen to be the same as last year, ranging from 16 to 31 years and averaging 20 years. The dairy students, as usual, were somewhat older. The religious denominations were as follows : *Regular Course*,—87 Methodists, 77 Presbyterians, 30 Episcopalians, 20 Baptists, 8 Roman Catholics, 5 Congregationalists, 3 Disciples, 2 Christian Association, 2 Christadelphians, 1 Mennonite, 1 Greek Orthodox, and 1 Friend ; *Dairy Course*,—64 Methodists, 30 Presbyterians, 17 Episcopalians, 7 Baptists, 4 Roman Catholics, 2 Congregationalists, 2 Lutherans, 1 Salvation Army, 1 Plymouth Brother, and 1 Evangelical.

Analysis of College Roll (*General Course*).

(1) From Ontario.

Algoma	1	Middlesex	10
Brant	4	Norfolk	1
Bruce	1	Northumberland	1
Carleton	6	Ontario	5
Dufferin	4	Oxford	9
Dundas	7	Parry Sound	2
Durham	2	Peel	2
Elgin	3	Perth	5
Essex	1	Peterboro'	4
Frontenac	1	Prescott	2
Glengarry	2	Prince Edward	2
Grenville	1	Renfrew	2
Grey	2	Russell	1
Ha'dimand	3	Simcoe	9
Halton	4	Stormont	2
Hastings	3	Victoria	3
Huron	12	Waterloo	6
Kent	1	Welland	6
Lambton	4	Wellington	14
Lanark	3	Wentworth	6
Leeds	2	York	13
Lennox	3	Toronto	12
Lincoln	7		197
Manitoulin Island	2		
Muskoka	1		

(2) From Other Provinces of the Dominion.

Manitoba	1	Prince Edward Island	3
Northwest Territories	1	Quebec	5
New Brunswick	2		22
Nova Scotia	7		
British Columbia	3		

(3) From Other Countries.

Bermuda	1	Jamaica	3
England	8	Asia Minor	1
Scotland	2		
United States	3		18

Total in general course. 237

The full College roll will be found with the appendices to this report, published in a separate volume.

County Students.

By an Act of the Legislature, each county council in the Province has power to send one student free of tuition. Of those on the roll in 1899, sixty were nominated by county councils, and as a consequence were exempt from the payment of tuition fees. The counties and districts which exercised the power of nomination last year (42 in number) were the following: Addington, Algoma, Brant, Carleton, Dufferin, Dundas, Durham, Elgin, Essex, Glengarry, Grenville, Grey, Haldimand, Halton, Hastings, Huron, Lambton, Lanark, Lennox, Lincoln, Middlesex, Muskoka, Norfolk, Northumberland, Ontario, Oxford, Parry Sound, Peel, Perth, Peterboro', Prescott, Prince Edward, Renfrew, Simcoe, Stormont, Victoria, Waterloo, Welland, Wellington, Wentworth, and York.

New Buildings and Alterations Needed.

The increase in the attendance of students has created the necessity for new buildings and some alterations in the buildings already provided. There is urgent need of about thirty additional dormitories; the physical laboratory has become too small for practical work with students in soil investigations and other branches of physical research; and the laboratory used in common by the horticulturist and biologist is now wholly inadequate for the work of the biological department in botany, zoology, and entomology. The classes are so large that they cannot be properly handled in either of these laboratories. Hence the repetition of last year's request for increased accommodation.

What has been suggested is as follows:

(1) That the portion of the main building now occupied by the library, library annex, and museum be converted into dormitories, which would furnish rooms for 45 additional students.

(2) That a large new building, costing about $35,000, be erected for the library, reading-room, a medium-sized assembly-room, the museum and geological cases, and an insectary for practical work in entomology, with class-room, offices, and laboratories for the department of biology, the library wing being fire-proof.

This would provide all that is required at present, except an addition to the physical laboratory.

English.

Most of the students at the college—and some of the very best—enter without having learned to speak and write good English. Hence we are still compelled to give a considerable amount of time to that subject. We do not aim at elegance, but we make an honest effort to secure clearness, correctness, and strength. We hope the time may soon come when we can insist on a higher standard for matriculation.

Physics.

The work in physics is increasing from year to year. In fact there is an unlimited field for investigation in soil physics; and our professor of physics has commenced several important experiments, but having to teach and work in the laboratory six or seven hours a day, he has very little time for systematic, continuous research. Hence I have recommended the appointment of a fellow in the department.

Biology and Geology.

We do not attempt an extensive course in geology, but a general outline of the subject, with special emphasis on Canadian geology, economic minerals, and soil formation. The lectures on this subject are given by the professor of biology.

In botany the course is broad and thorough, taking in all the branches of the subject and giving special attention to economic plants, noxious weeds, and injurious fungi, such as smut, rust, apple scab, etc. In zoology an outline of the animal kingdom is given, with more or less laboratory practice; and the work on entomology deals as thoroughly as possible with the beneficial and injurious insects found in the Province.

During the past year the work in the department, under Prof. Lochhead and his assistant, M. W. Doherty, has gone on as usual, notwithstanding the lack of room and the fact that Prof. Lochhead had to give a considerable amount of time to outside investigation of the San José Scale and to the fumigation of nursery stock in the Province.

Chemistry.

In addition to the ordinary class room and laboratory instruction, work has been done on two or three practical lines:

(1) An experiment in growing certain varieties of grain in cylinders, to test the relative effects of surface and subsoil watering, with a view to determining the importance of frequent surface cultivation for the preservation of soil moisture in dry weather.

(2) The analysis of sugar beets from different parts of the Province, in order, if possible, to settle the question as to the feasibility of manufacturing beet-root sugar in Ontario.

(3) The analysis of varieties of wheat and the making of bread therefrom, to determine the gluten content and actual value of each variety from the baker's standpoint.

(4) Digestion experiments, to determine the feeding value of Lucerne, cut at different stages of maturity. The results of these experiments will be found in a bulletin on Lucerne prepared and sent to the Department of Agriculture a short time ago by Robert Harcourt, the Assistant Chemist.

An account of these experiments, excepting the last, will be found in Dr. Shuttleworth's report (Part V of this volume), and also a description of a very valuable invention made by Dr. Shuttleworth while in Germany, whereby much more accurate and reliable analyses of plants of all kinds can be made than were possible with the apparatus previously used.

Veterinary Science.

Our veterinary department furnishes a good course of instruction, with considerable practice in the examination of horses for blemishes, the diagnosis of disease, and the administering of medicine. The work in this department during the past year has been much the same as usual; and the only thing specially noteworthy is that some of the time hitherto devoted to veterinary anatomy has been transferred to horse-judging; and the change in this respect has proved a popular one among the students, because they think it will assist them in determining the value of horses for their own use and in judging at the local fairs and exhibitions.

An account of the year's work and of the treatment of certain ailments among the live stock will be found in Part VI of this volume.

Dairy Department.

An extra course of three weeks in butter-making was given in the dairy school last year. The course began on the 1st December and was intended for makers throughout the Province, students in the regular college course, and others who could not attend during the longer session of twelve weeks, commencing on the 4th of January. This extra course was very well patronized, and the attendance at the school for the year was larger than usual, amounting to a total of 129.

During the remaining eight months of the year (when the school was closed), a considerable amount of experimental work in butter-making and cheesemaking was done, with special attention to the curing of cheese at different temperatures. For a full account of the work, see Part VII of this report.

Farm Department.

Some of the crops on the college farm were not so good as usual last year. The fall wheat was a complete failure, having been winter-killed to such an extent that scarcely a stalk was left. The other crops were fair, but not so heavy as in some previous years. Consequently the amount of feed for farm stock is somewhat less than was expected,—a circumstance which will be felt more than at other times, owing to the fact that we had not the usual sale of surplus stock last fall.

To our great regret, Mr. Wm. Rennie resigned his position as Superintendent of the farm 1st of October last. Having spent exactly six years at the college, and having in that time had an opportunity to fence most of the farm, clear up the broken portions, and illustrate his methods of cleaning and cultivating land, he decided to retire from the position, which he had found to be one constant anxiety, much labor, and great responsibility. During Mr. Rennie's stay with us he revolutionized the college farm, having cleaned it, improved its appearance, and increased its fertility; and, now that he is gone, I may be permitted to say that William Rennie is one of the very best cultivators of the soil to be found in this or any other country, and one of the most pushing and faithful workers I have ever met, devoting himself late and early, with untiring energy, to the duties of his position—never doing anything to glorify William Rennie but always willing to incur unpopularity, if need be, in the faithful and unflinching discharge of his duty. May he enjoy his well-earned repose!

As a young man, G. E. Day, B.S.A., discharged the duties of Professor of Agriculture and Experimental Feeder; and now, after time for development and more extended experience. he has taken entire charge of the Department of Agriculture (lectures, farm management, and experimental feeding), and it is hoped that he may be able to carry on successfully the work so well begun by Mr. Rennie.

For an account of the experiments in feeding cattle, sheep, and swine, see Part VIII.

Horticulture.

The scope of the work in the Horticultural Department has been enlarged a good deal within the last few years. The orchards and small fruit plantations have been considerably extended and many variety tests have been made, including raspberries, blackberries, currants, gooseberries, strawberries, tomatoes, and a number of ornamental plants, especially geraniums and coleus.

The greenhouse branch, I need scarcely say, is one of the strong arms of the department. It furnishes the means of practical instruction in botany and horticulture during the winter months—almost the only months which we have for the purpose, as the farmers of the Province cannot spare their sons during the spring and summer months, when there are plenty of plants outside. If we could get our students in spring and summer, we should not need more than one or two greenhouses; but as it is we have to incur the expense of keeping up a full set of houses.

For an account of the work and experiments in the department, see Part IX.

Bacteriology.

By permission of the Minister of Agriculture, the Professor of Bacteriology went to Europe last summer to pursue certain lines of investigation further than was possibly in this country, intending to learn the methods and do a certain amount of work in the bacteriological laboratories in England (London and Cambridge), Switzerland, Denmark, Germany, Austria, France, and Italy. In his absence, the work was taken charge of by Malcolm N. Ross, B.S.A., fellow in the department, and was kept well in hand until Mr. Ross suddenly enlisted and left with the first section of the second contingent for

South Africa. Since Mr. Ross's departure, the laboratory (with the manufacture of tuberculin, etc.) has been in charge of Dr. E. W. Hammond, who came to us highly recommended by Prof. Adami, of McGill University.

During the year, Mr. Ross has spent a good deal of time on the investigation of roup in fowl, the bacteriology of cheese-curing, starters for cheese-making and butter-making, the causes of bitter milk, gassy curd, etc., and has given the results of his work in Part X of this report.

Field Experiments.

The work in field experiments at the College and throughout the Province has been carried on vigorously during the year. We have about forty-four acres devoted to testing of varieties of grain, corn, roots, potatoes, grasses, clovers, forage plants, fodder mixtures, etc., and to experiments in the selection of seeds, date of seeding, methods of cultivation, kinds of manure, and other things bearing on questions which arise from time to time among the farmers of the Province.

The work on the College experimental grounds is carried out very systematically, and the varieties which give the best results in tests of five or six years' duration at the College are sent out by the Experimentalist to be further tested by ex-students and others throughout the Province. Last year 3,845 co-operative experimenters, with 12,035 plots, assisted in this work—some in every county in the Province. The counties which sent the greatest number of satisfactory reports were the following:

Western Ontario—Grey, Huron, Bruce, Middlesex. *Central Ontario*—Simcoe, Ontario, Muskoka, Parry Sound District. *Eastern Ontario*—Hastings, Renfrew, Prince Edward, and Carleton.

For a full account of the work in the department, see the Report of the Experimental Union for 1899 and Part XI. of this report.

Poultry.

The continuity of the work in the Poultry Department was interfered with to some extent by a change in the management last spring. The present manager, W. R Graham, B.S.A., entered on his duties on April 17th, when it was too late to control the hatch of early chickens for the year. Consequently he is not wholly responsible for the results of the year's operations; and it is due to him to say that the overdraft for the purchase of stock, etc., was not on account of purchases made by him.

Since Mr. Graham took charge he has given a good deal of attention to practical experiments in egg production, the preservation of eggs, the use of the cramming machine and the rearing, feeding and dressing of birds for home and foreign markets; and in order to assist him in his efforts to give the work of the department a distinctively practical bearing, we have erected a cheap but commodious incubator and brooder house for hatching and rearing early chickens to be fed for the British market.

For a brief account of the work done in the department during the last eight months, see Part XII. of this report.

Bee-Keeping.

Arrangements for lectures and experimental work in apiculture were made for 1899 as for some years past, but on the 22nd July Mr. R. F. Holtermann, who has had charge of the work, sent in his resignation, informing us of his decision to give up business and at once engage in evangelistic work. It was then too late to plan or undertake new experiments, and as a consequence we have to report only a brief account of the lectures as given by the new lecturer, Mr. H. R. Rowsom, in Part XIII. of this volume.

Gymnastic and Military Drill.

Most of our students devote a short time to gymnastic exercises during portions of the fall and winter terms. None of them are required to take military drill, but for years

past a considerable number have voluntarily taken a somewhat thorough course of training in rifle and battery practice, and I think the effect on their physique, manners, and general bearing has been clearly beneficial.

Class-Room Work.

The class-room work in the different departments has gone on as usual. Eleven candidates wrote for the B.S.A. degree in the University of Toronto, and nine of them were successful. A fair proportion of first and second year students gained a respectable standing in our College examinations; but the percentage of failures is still very large, resulting in some cases from idleness, but in most instances from a lack of early training in the elementary branches of an English education.

The third year examinations were conducted, as usual, by examiners appointed by the Senate of the University; and those of the first and second years by the professors and instructors of the College, with the assistance of Wm. Tytler, B.A., of Guelph.

Bachelors of the Science of Agriculture.

The examinations for the degree of B. S. A. were held in the month of May, and the successful candidates received their degrees at the commencement exercises of the University in June. The list is as follows :

Buchanan, J.	Hensall, Huron, Ont.
High, A. M.	Jordan Station, Lincoln, Ont.
Hutt, W. N	Southend, Welland, Ont.
Jarvis, C. D	Guelph, Wellington, Ont.
Mallory, F. R.	Frankford, Hastings, Ont.
Marshall, F. R.	Westbrook, Frontenac, Ont.
Murdoch, G. H.	Bobcaygeon, Victoria, Ont.
Price, W. J	Marsville, Dufferin; Ont.
Raynor, M	Rose Hall, Prince Edward, Ont.

Recipients of Associated Diplomas.

*Brokovski, A. J.	Battleford, N. W. T.
Crerar, A. H	Molesworth, Perth, Ont.
Crow, J. W.	Ridgeville, Welland, Ont.
Fawell, L. A	De Cewsville, Haldimand, Ont.
Goble, F. W.	Woodstock, Oxford, Ont.
Hutchison, J. R.	Escott, Leeds, Ont.
Hutton, G	Easton's Corners, Grenville, Ont.
Ketchen, J. B.	Brocklin, Ontario, Ont.
Kidd, C	Cookstown, Simcoe, Ont.
§Lewis, E R.	Burford, Brant, Ont.
Linklater, W	Stratford, Perth, Ont.
McCarthy, J. D	Norwood, Peterboro', Ont.
McIntyre, G. A.	Renfrew, Renfrew, Ont.
McMillan, E J.	New Haven, P.E.I.
Mortureux, C. E.M.	Quebec, Quebec.
Peters, C. R	Elmhurst, N B.
‡Reid, R. H.	Reaboro, Victoria. Ont.
Robertson, J. A.	Blantyre, Grey, Ont.
Semple, W. C.	Tottenham, Simcoe, Ont.
Stewart, A.	Ivan, Middlesex, Ont.
§Vanatter, P. O.	Ballinafad, Wellington, Ont.
†Wilson, R.	Fordwich, Huron, Ont.

* To take a supplemental examination in Chemisty.
§ " " " Literature
‡ " " " Chemistry and Entomology.
† " " " Physics.

First-Class Men.

The work of the College is divided into four departments; and all candidates who obtain an aggregate of seventy-five per cent. of the marks allotted to the subjects in any department are ranked as first-class men in that department. The following list contains the names of those who gained a first-class rank in the different departments at the examinations in 1899, arranged alphabetically:

First Year.

Harris, G. S., Toronto, Ont., in two departments; Natural Science and Mathematics.
Mills, P. G., Sussex, N.B., in one department; Mathematics.
Murray, J., Avening, Ont., in one department; Mathematics.
Pickett, B. S, Vittoria, Ont., in three departments; Natural Science, English, and Mathematics.
Russell, J. McK, Freeman, Ont., in three departments; Natural Science, English, and Mathematics.

Second Year.

Linklater, W., Stratford, Ont., in three departments; Agriculture and Live Stock, Natural Science, and English and Mathematics.
McMillan, E. J., New Haven, P.E I., in three departments; Agriculture and Live Stock, Natural Science, and English and Mathematics.
Putnam, G. A., Guelph, Ont, in one department; English and Mathematics.
Robertson, J. A., Blantyre, Ont., in one department; Natural Science.

Scholarships.

Scholarships of $20 each in money were awarded for groups of subjects in first year work as follows:

Highest standing, with a minimum of 40 per cent. of the marks for each subject and an aggregate of 75 per cent. of the total number of marks allotted to the subjects in the group—

I. Agriculture, dairying, veterinary science, and poultry.—*Not awarded.*
II. Botany, bee-keeping, and horticulture.—*J. McK. Russell.*
III. Physics, chemistry, geology, and zoology.—*B. S. Pickett.*
IV. English literature, mathematics, book keeping, and drawing.—*J. Murray.*

Prizes.

Prizes were given as follows:

Essay on "Farm Hygiene"—$10 in books to *C. E. M. Mortureux.*

First place in general proficiency on first and second year work, theory and practice—$10 in books to *E. J. McMillan.*

Highest standing in general proficiency, with first class honors in one department, at University Examinations for B.S.A. degree—$10 in books to *W. J. Price.*

Cost of Agricultural Colleges.

In my report of last year, I ventured to state and undertook to prove that a strong and well equipped agricultural college requires a larger expenditure on capital and maintenance accounts than an equally strong and aggressive arts college or university. I think there can be no doubt about the correctness of the statement, and my reason for referring to the matter again is that I find some of our legislators still inclined to compare us in work and expenditure with the high school rather than with the arts college or university—I say "arts," because nearly everything done in Canadian universities beyond what is covered by the word "arts," is provided for without charge on university funds.

After years of observation, the leading states of the American Union are gradually coming to the same conclusion regarding the relative needs of agricultural and arts colleges. I could quote a score or more in support of my contention; but I shall refer to only three or four:

Agricultural College of the State of Wisconsin—

Annual expenditure, apart from erection of buildings	$60,000
Amount of salaries paid annually for a portion of the course.	28,000

Instruction in English, mathematics, and the natural sciences being furnished free by the State University at the same place:

Agricultural and Mechanical College of Iowa—

Annual expenditure, apart from buildings	$100,000
Annual salary bill	50,000

Four of the principal buildings cost as follows: Main building, $80,000; Agricultural Hall, $45,000; Morrill Hall, $38,000; and Margaret Hall, $50,000—nearly paid for by direct taxation. This was prior to January, 1899; and the following information, received a few days ago from a member of the staff of that institution, indicates the present attitude of the State Legislature:

"Our Legislature has been very liberal with us this year, much more so than with the State University; and, as it may interest you, I may say that they have passed a tax levy by which we get one-tenth of a mill on all taxes raised in the State for a period of five years, which gives us about $53,000 a year. They limited the maximum under this head to about $55,000 a year. In addition to this, we are getting for support and repairs, $31,500, for two years, and this will likely be increased. The buildings provided for are—engineering, $75,000; horse barn, $7,500; President's house, $7,500; and for the purchase of stock, $10,000"—all this for a college that has a regular income of $100,000 a year.

Agricultural and Mechanical College of Michigan—

Annual expenditure, apart from buildings	$108,900
Annual salary bill	42,500

This institution has a large number of expensive buildings and is still adding to its equipment. The State Legislature gave it $95,000 for a ladies' building last year.

The Legislature of Minnesota is still more liberal in voting money for its Agricultural College; but I must not occupy space with further quotation of figures.

Ontario Agricultural College and Experimental Farm—

Total maintenance expenditure of all departments of College, Farm, Dairy School, and Experimental Station	$57,433 56
Salary bill (included in total)	25,038 00

Financial Statement.

No profit and loss statement for the Farm Proper has been made out, because there was a change of superintendents on the 1st October, and we had not an opportunity to bring the Superintendent and Ex Superintendent together to make out such a statement. In the statement on the following pages I give the results of only the cash transactions for the year.

Ontario Agricultural College,
Guelph, December 30th, 1899.

JAMES MILLS,
President.

I. COLLEGE EXPENDITURE.

(a) *College maintenance.*

1 *Salaries and wages*	$21,090 38	
2. *Food*:		
Meat, fish, and fowl	4,946 09	
Bread and biscuit	917 54	
Groceries, butter and fruit	5,039 57	
3. *Household expenses*:		
Laundry, soap, and cleaning	125 45	
Women servants' wages	1,907 61	
4 *Business department*:		
Advertising, printing, postage, and stationery	1,247 88	
5. *Miscellaneous*:		
Maintenance of chemical laboratory	367 29	
" physical laboratory	246 84	
" biological laboratory	244 35	
" bacteriological laboratory	318 63	
Library and reading room, books, papers, and periodicals	1,091 82	
Scholarships	100 00	
School assessment	140 40	
Unenumerated	478 34	
		$38,262 19

(b) *Maintenance and Repairs of Government Buildings.*

Furniture and furnishings	$867 08	
Repairs and alterations	1,254 29	
Fuel	3,155 91	
Light	1,056 23	
Sewage disposal	394 23	
		6,727 74
		44,989 93

College Revenue.

Fees	$ 2,336 45	
Balance on board accounts after deducting allowances for labor	6,086 78	
Gas used by students in laboratories	100 00	
Supplemental examinations	20 00	
Analysis of soil and water in chemical laboratory	25 00	
Chemicals and breakage in chemical laboratory	67 11	
Breakage in physical laboratory	7 85	
" bacteriological laboratory	10 10	
Refund of books lost by students	5 00	
Sale of oil to other departments	46 71	
" tuberculin	11 45	
" starters	2 30	
" old horse	32 09	
" scrap iron	6 95	
Contingencies—fines, breakage, etc	157 91	
		8,915 61
Net expenditure of College for year		$36 074 32

II. FARM EXPENDITURE.

(a) *Farm Proper.*

1. *Permanent improvements*—fencing, new water basins in stable, etc		$218 49
2. *Farm maintenance* :		
Salary of Superintendent (9 months)	900 00	
Wages of foreman and men	2,987 31	
Purchase of live stock—steers for feeding, etc.....	1,749 95	
Maintenance of stock	539 75	
Seed	181 70	
Binding twine	31 88	
Repairs and alterations (blacksmithing, etc.)	389 12	
Furniture and furnishings	185 97	
Tools and implements	95 66	
Advertising, printing, postage, and stationery	61 60	
Fuel and light	26 76	
Contingencies	121 77	
		7,271 47
		7,489 96

Cash Revenue of Farm Proper.

Sales of cattle :		
24 steers—34,400 lbs. @ $5.50	$1,892 00	
3 bulls—$87, $77, $42	206 00	
5 grade cows—2 at $40, 2 at $30 50, 1 at $50.....	191 00	
6 " calves—4 at $1 50, 1 at $2, 1 at $5	13 00	
8 pure bred calves (sale of 1898)	370 25	
Sales of pigs :		
7 pigs—1,615 lbs. at $5.00.....	80 75	
8 " 1,840 " 4.65.....	85 56	
6 " 1,015 " 4.10.....	41 61	
21 " 3,975 " 4.00	159 00	
6 " 1,232 " 3.90.....	48 04	
3 " 631 " 3.75.....	23 66	
1 " 235 " 3.50.....	8 22	
8 " 2,793 " 2.75.....	76 80	
11 old boars	19 97	
41 pigs (sale of 1898).....	437 05	
Sales of sheep—25 sheep and lambs at $3 to $12	172 35	
" wheat—50 bush. at 65c.....	32 50	
" " 169½ " 66c.....	111 87	
" " 53.23 " 68c.....	36 28	
" " 190¾ " 69c.....	131 62	
" barley—202½ " 65c,40 bags at 20c,25 bags at 10c	142 15	
" oats—142.21 " 50c,31 bags at 20c,33 bags at 10c	80 80	
" peas—56.34 " 80c, 14 bags at 20c, 5 bags at 10c	48 55	
" potatoes—78 19 " 80c,18 bags at 20c,22 bags at 10c	68 45	
" wool—202 lbs. (unwashed) at 10c	20 20	
" " —230 " " at 12c	27 60	
" milk—2,945 lbs. at 67c. per 100	19 73	
" " —2,154 " at 68c. "	14 65	
" " —2,026 " at 70c. "	14 18	
" " —2,074 quarts at 4c.	82 96	
" hides—3 hides.....	5 63	
" old fence posts and boards.....	7 75	
Rent of pasture	5 00	
Service of animals	168 00	
		$4,843 18

Net expenditure of Farm (allowing nothing for feeding of dairy stock, supplies to College, etc.)		$2,646 78

(b) Field Experiments and Experimental Feeding.

1. *Field Experiments.*

Salary of Director	$1,500 00	
Foreman	400 00	
Teamsters	532 50	
Wages of laborers	2,272 76	
	$4,705 26	
Seeds	344 82	
Manure and special fertilizers	139 80	
Furnishings and repairs (blacksmithing, etc.)	314 54	
Printing, postage, and stationery	126 65	
Tools and implements	69 87	
Purchase of horse	125 00	
Contingencies	19 16	
Net expenditure on field experiments		$5,845 10

2. *Feeding Experiments.*

Stock for feeding	$1,069 80	
Maintenance of stock	741 79	
Experimental feeder	360 00	
Repairs and alterations	32 10	
Postage and stationery	8 00	
Contingencies	8 65	
	$2,220 34	

Revenue.

Sales of cattle—12 steers, 16,915 lbs. @ $5	$845 75	
" pigs— 5 pigs, 882 lbs. @ $4.65	41 00	
" " —37 " 5,409 lbs. @ $4.37½	258 75	
" " — 5 " 840 lbs. @ $4.12½	34 70	
" " —42 " 5,982 lbs. at $4.00	239 28	
" " — 6 " 797 lbs. @ $3.75	29 89	
" " — 5 " 992 lbs. at $3.50	34 73	
" Sheep—13 sheep, 1,570 lbs. @ $5.00	78 50	
	$1,562 60	
Net expenditure on experimental feeding		$657 74

III. DAIRY DEPARTMENT.

(a) Dairy School.

Wages of instructors	$1,518 30	
Engineer (3 months)	90 00	
General helper (3 months)	90 00	
Board of engineer (3 months)	32 14	
Cleaning, painting, repairs, etc	287 01	
Dairy appliances– separators, vats, etc	631 32	
Expenses of cheese and butter judges	6 00	
Expenses inspecting factories	37 65	
Books, magazines, papers, etc	8 50	
Advertising, printing, postage, and stationery	112 95	
Fuel and light	313 97	
Purchase of milk for use in school	3,303 55	
	$6,431 39	

Revenue.

Sales of butter—9,113½ lbs @ 20 to 23c	$1,990 05	
" cheese—13,192¼ lbs. @ 7 to 10½c	1,059 40	
" skim-milk—19,410 lbs. @ 10c	19 41	
" whey—part make	10 00	
" cream—1½ qts. @ 20c	30	
		$3,079 16
Net expenditure of dairy school		$3,352 23

(*b*) *Experimental Dairy.*

Salary of butter maker	$558 72
" cheese-maker (9 months)	500 00
" engineer and assistant in experimental work (9 mos.)	270 00
" cattleman and assistance in milking	520 37
Temporary assistance	35 00
Purchase of milk for experimental work	1,508 74
Purchase of cows	394 53
Feed and fodder	577 53
Furniture, furnishings, and repairs	901 73
Advertising, printing, postage, and stationery	58 40
Laboratory expenses	17 49
Fuel and light	302 19
Contingencies	267 13
	$5,911 83

Revenue.

Sales of butter—5,100 lbs. @ 14 to 22c	$1,965 64	
" cheese—13,482 lbs. @ 6 to 11½c	1,276 01	
" milk—38,756 lbs. @ 75 to 97c per 100	364 45	
" " —1,566 qts. @ 4c	62 64	
" skim-milk—68,230 @ 10 to 15c per 100	70 64	
" whey—season's make	37 50	
" cream—120 qts. @ 15c	18 00	
" " —96½ qts. @ 20c	19 30	
" cattle—16 cows	440 00	
" calves—2 pure-bred calves	30 00	
" " 12 grade calves	30 95	
" separator	25 00	
" wagon	45 00	
" appliances—3 vats and 2 curd knives	25 75	
		$4,410 88
Net expenditure of experimental dairy		$1,500 95

IV. POULTRY DEPARTMENT.

Salary of manager	$633 33
Temporary assistance	11 40
Purchase of stock	181 10
Feed, etc	235 94
Furnishings, repairs, etc	299 20
Fuel and light	68 94
Contingencies	71 42
	$1,501 33

Revenue.

Sales of poultry—106 birds @ 50c to $5	$130 25		
" dressed poultry—9 pairs	5 25		
" " —36 chickens, 130 lbs. @ 8c	10 40		
" eggs for setting—40 5/12 doz. @ $1.00	40 70		
" " —61 2/12 doz @ 1.50	91 75		
" eggs—249½ doz. @ 11 to 25c	34 45		
		$312 80	
Net expenditure of poultry department			$1.188 53

V. HORTICULTURAL DEPARTMENT.

1. *Permanent improvements*—new iron staging in greenhouse			124 35
2. *Maintenance*—			
Salary of head gardener and foreman		$650 00	
" assistant gardener and florist		528 00	
" assistant in greenhouses		291 78	
Teamster		348 00	
Wages of laborers		1,417 71	
Manure and fertilizers		92 01	
Seeds, bulbs, plants, and trees		251 90	
Implements, tools, furnishings, repairs, etc.		613 58	
Fuel and light		407 84	
Contingencies		176 37	
		4,777 19	

Revenue.

Sale of berries—454½ boxes @ 4c.	$18 18		
Sale of vegetables	2 95		
Incidentals	9 05		
		30 18	
			$4,747 01
Net expenditure of department (nothing having been allowed for fruit, vegetables, etc., supplied to the College)			$4,871 36

VI. MECHANICAL DEPARTMENT.

Salary of foreman (9 mos.)	$524 97	
Extra carpenter and builder	699 96	
Tools	48 88	
Fuel and light	22 74	
Expenditure of mechanical department		$1,296 55

SUMMARY.

Total net expenditure:		
I. College and government buildings	$36,074 32	
II. Farm:		
1. Farm proper	2,646 78	
2. Field experiments	5,845 10	
3. Experiments in feeding	657 74	
III. Dairy department:		
1. Dairy School	3,352 23	
2. Experimental Dairy	1,500 95	
IV. Poultry Department	1,188 53	
V. Hort. Department—gardens, orchards, lawn, arboretum, etc	4,871 36	
VI. Mechanical department	1,296 55	
Total net expenditure in 1899		$57,433 56

Total sum voted for 1899, $57,967.

PART II.

RESIDENT AND ENGLISH MASTER.

To the President of the Ontario Agricultural College :

SIR,—I beg to submit the following report of my work during the past year.

My chief duties in the residence have been presiding in the dining-hall of the college, superintending students' studies, inspecting the college furniture, and seeing that rules and regulations have been carried out.

Regarding the dining-hall, I am pleased to be able to report that a very fair degree of order and decorum has been maintained, the students generally having shown a disposition to accept advice, and act on the suggestions that have been given from time to time. With the accommodation and service that we have in connection with the boarding department, the conditions are probably as satisfactory as could be expected.

In superintending students' studies, I have visited the students' rooms at least once each evening, and have seen that the study-period has been favourable to close application. With few exceptions, the students have been careful to observe the regulations of the college regarding study. With reference to the effect of systematic study, I may say that many students, who, on entering the college, found it difficult to read and think continuously during the period set apart for study, have developed, through practice, considerable power of application.

Regarding the college furniture, I am glad to be able to report that in only one or two instances have I had to deal with cases of wanton defacement; and that there has been very little damage of any kind. The fact that there has been such slight damage is very gratifying, as the care of the college property has been felt as a great responsibility.

With reference to discipline, I wish to say that a majority of the students have manifested a spirit of self-government which has made it comparatively easy to maintain order in the residence. It has been my constant aim to encourage this spirit of self-government in every way; for I have thought that moral education lies mainly along the line of self-government.

My class-room work comprises lectures in English Grammar, Composition, Mathematics, Drawing, and Book-keeping. In giving instruction in these subjects, I have met from three to four classes each day during the two terms.

Our work in English has been practical in its bearings, only such technical points as seemed indispensible having been introduced. Special attention has been given to syntax as being, from a practical point of view, the most important part of grammatical study. The writing and correction of fortnightly essays, and the punctuation of typical sentences, have also formed an important part of our work in English.

The course in mathematics has also been very practical, comprising the measurement of land, lumber, timber, masonry; mensuration, with special reference to the properties of the triangle and circle, and the determination of the cubical contents of such solid figures as the sphere, the cylinder, prisms, and the cone and pyramid, with their frusta; a pretty thorough drill in vulgar fractions and decimals; and a fairly extensive course in commercial arithmetic.

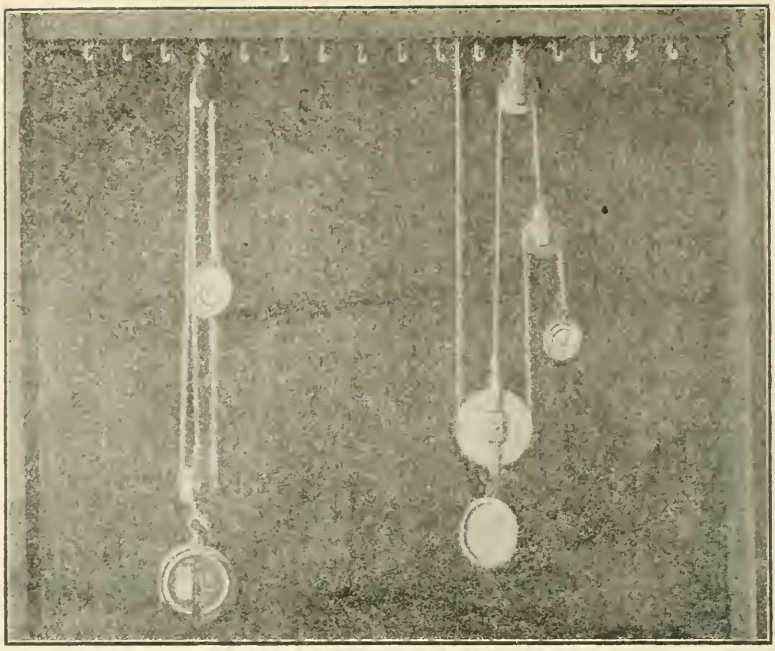
The work in drawing comprises the drawing of plans of barns and outbuidings, some drawings original, others from models; and geometrical drawing, comprising figures, such as might occur in connection with the mechanics of the farm.

The course in book-keeping comprises commercial forms, business correspondence, and the keeping of practical accounts.

Respectfully submitted,

I. N. BECKSTEDT,
Resident and English Master.

ONTARIO AGRICULTURAL COLLEGE,
GUELPH, Dec. 30th, 1899.



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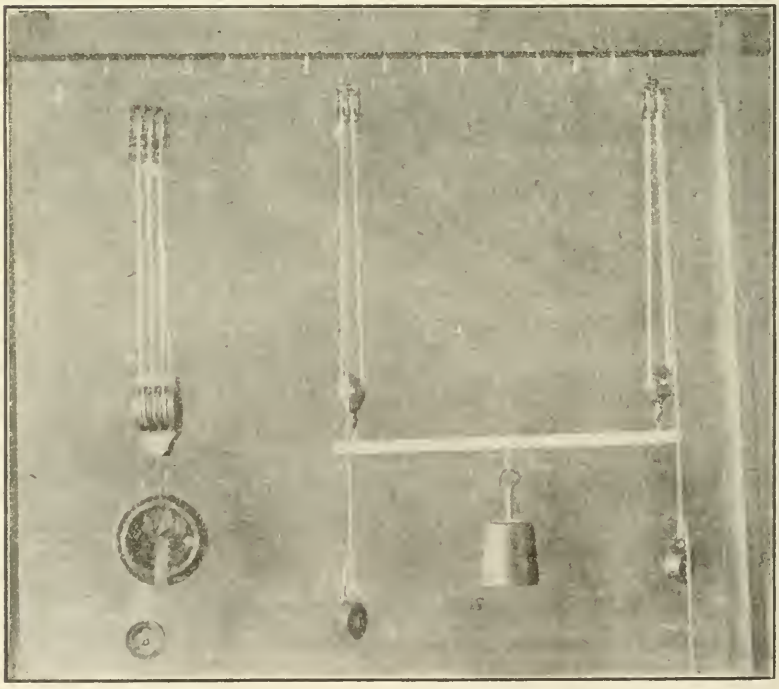

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PART III.

PROFESSOR OF PHYSICS.

To the President of the Ontario Agricultural College :

Sir,—I have the honor to present herewith my report on the work in the departments of English literature and physics.

English Literature.

Under this head I have but little to report. The students in all classes continue to show an encouraging interest in the study of English literature for its own sake, for its liberalizing and culturing influences. We are, I think, doing all that should be done in this study. But we are decidedly weak in two regards, one of them coming especially within my department. I refer first to the instruction and practice given in the writing of essays, and secondly to the preparation and delivery of speeches. In the past we have done very little in the former, and nothing in the latter. Much more time than is at present given to practical instruction in composition could profitably be spent on that subject. I try to keep before the minds of the students, as an ultimate object, the preparation of articles and papers for the agricultural press and for institute lectures. But this cannot be done without much practice on their part and much drilling and correcting on the part of the teacher.

As to practice in speaking, the College Literary Society is to be highly commended for the initial step it has taken in this matter. Last year the society offered five prizes for a public contest in oratory. The number of the competitors, and the excellence of the speeches delivered, showed that we have exceedingly good material at the college for the making of good public speakers. It seems to me that the college should second the efforts of the literary society by affording some kind of instruction in this important accomplishment. And the most feasible plan that occurs to me is to establish seminary classes in connection with each department of instruction. Each professor might, say once a month, assign a topic to be discussed at some subsequent lecture period, naming certain members of the class as leaders in the discussion. In that way their powers of expressing might be cultivated in connection with practical themes, and thus we might pave the way for each student to take a similar part in larger spheres and on wider questions.

Instruction in Physics.

First Year.—*Mechanics* comprises a study of various mechanical appliances, such as pulleys, levers, jacks, and their application to the work of the farm. Often implements are allowed to stand out of doors all the year round for want of space in the implement shed or elsewhere. All the implements on the farm may be stored in a small shed, if the whole space is utilized. By means of proper appliances implements may be hoisted and suspended from the ceiling. By similar means, grain, meat, barrels of fruit, and other heavy things may be handled with ease, and thus many a hard lift saved.

In the instruction in mechanics each student is required to study many different kinds of labor-saving devices, and to find out the advantages and uses of each. This work is done in the winter term, and consists partly of lectures in the class-room but mostly of practical work by the students themselves.

Two handy appliances for raising implements, carcases, etc.—No. 1 consists of a sheaf at the top containing two pulleys, and a single pulley below. It will be seen that one pound balances three pounds: that is, a weight of 300 pounds can be raised by a force of little over 100 pounds. This appliance will raise an object from the floor to the ceiling.

With three separate pulleys on hand, No. 2 is a very convenient arrangement for raising weights a short distance. It will not raise an object more than half way to the ceiling, but is more powerful than No. 1, the advantage being 4 to 1.

No. 3 is a very useful system of pulleys. It consists of two sheaves, each containing 3 pulleys. A single long rope serves. It is powerful—6 to 1—and will raise an object to any desired height.

No. 4 is an excellent model of an arrangement for hoisting large implements to the ceiling of an implement shed. It consists of 2 pairs of sheaves, each sheaf containing 2 pulleys. By this means two men can hoist almost any implement to the ceiling with ease.

Second Year.—*Surveying*, comprises a six weeks' course in measuring land areas of regular and irregular shapes, chaining over hills and past obstructions, erecting perpendiculars, and taking levels previous to laying drains. This is mainly outside practical work, done in the fields or on the lawn during October and part of November.

The Physics of Liquids and Gases.—This opens the very large question of conveying water from springs, wells and other sources, to farm buildings and to the farm house. The various methods are discussed,—the pump, the windmill, the siphon, the hydraulic ram, and the suitability of each method to the different circumstances that may be found. In this connection I discuss with the class some questions relating to water-conveyance that have been received from farmers in this Province, and in this way we cover, in a practical fashion, a variety of circumstances and the best method of dealing with each.

Also, under this head come some of the most important questions in soil physics, such as the moisture of the soil, soil air, and the relation of drainage, cultivation and fertility to these two essentials. In illustration of these questions, a series of experiments is conducted by each student, one afternoon a week throughout the winter term.

Electricity.—In the winter term the subject of electricity receives some attention, chiefly in the direction of electrical machinery.

Third Year.—The third year work in this department consists mainly of advanced reading, lectures, and practice along the same direction as in the second year, with additional work in weather and meteorology observations, and a series of experiments in soil temperatures, a sample of which experiments is given later in my report. Also the special students in agriculture make complete examinations of some typical soils, experimenting with a view to determine the behavior of these soils towards water, air, and the heat of the sun, and making a physical analysis to show the amount of sand, clay, and humus, the condition of the humus, whether immediately available for plant food or not, and the texture of the soil generally. And the special students in dairying receive a course in the physics or dairy products, and in the principles of refrigeration, cold storage, and the control of temperature and moisture in the cheese room.

The Influence of Surface Cultivation on the Moisture of the Soil.

This work is a continuation of the experiments described in the report of last year. Two plots, to all appearances identical in their conditions, were chosen for the experiment, the surfaces being subjected to different treatments. We took the plots in hand after they had been cultivated and harrowed ready for seeding. The surface of the one plot was first rolled, and throughout the season was kept smooth and compact, while the surface of the other was first carefully loosened and pulverized to the depth of about three inches. This operation on the second plot was repeated through the entire season whenever a crust was observed to have formed. It was noticed particularly that a crust would form frequently when there had been no rain since the previous cultivating. An ordinary dew is sufficient to form a perceptible crust.

Although these plots contained each only one square rod and were side by side, yet we found, on taking the first sample for the determination of moisture, that the subsoils were quite dissimilar, varying from a fairly compact nature to one quite loose and open. As a consequence of this difference in the subsoils, the per cent. of moisture at the beginning of the experiment, determined before the plots were prepared finally, was as follows: No. 1, surface, 26.7 per cent.; subsoil, 18 per cent. No. 2, surface, 25.05 per cent.; subsoil, 15 per cent. On account of this large difference, we at first thought it advisable to choose another locality, but finally decided to continue the work on this spot, and to choose for our cultivated plot No. 2, with the poorer subsoil, and determine to what extent surface cultivation can overcome natural disadvantages.

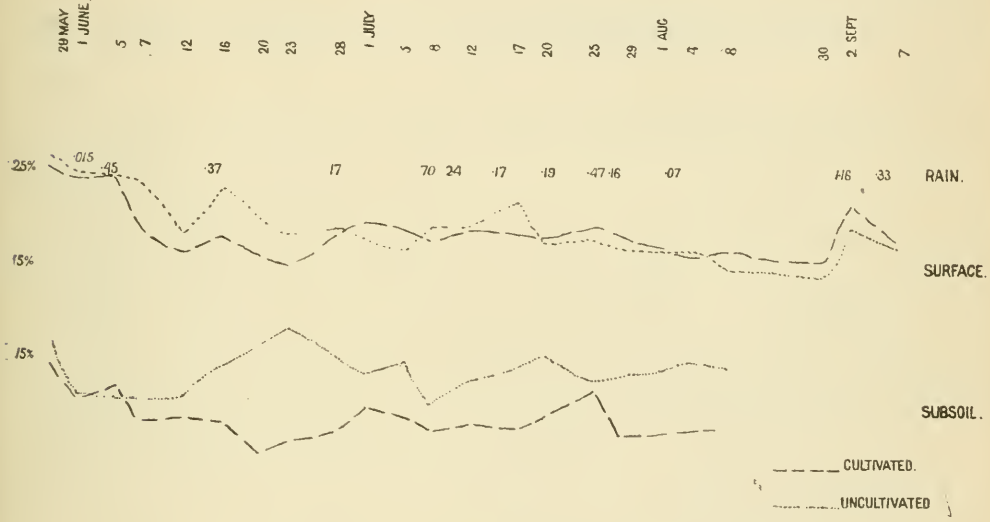
No. 1 plot, then, receives no cultivation after it has first been rolled. The surface is kept firm and smooth. It has a good subsoil, capable of holding a large supply of water, from which the surface will draw in dry weather.

No. 2 plot is cultivated frequently, the object of cultivation being to prevent the formation of a crust and to keep the surface fine and loose, and thus to prevent the water

from below from finding its way to the surface and evaporating. But this plot has a very open, sandy subsoil, with a low water-holding power, and hence the surface of this plot has a much poorer reserve from which to draw in time of drouth.

The results are presented in a graphic form in the accompanying chart. The dotted lines represent the curves of moisture for the surface and subsoil of the uncultivated plot, and the short strokes show the curves for the cultivated plot. The dates on which the determinations were made are recorded in the line across the top, and the second cross-line of figures are the amounts of rainfall for the season.

The lower diagram contains the subsoil curves for the two plots. The per cent. of moisture varies mainly from 5 to 15 per cent., and the superiority of the subsoil of plot No. 2 is quite apparent from the diagram. This subsoil containing a much larger amount of moisture throughout the entire season, on account of its texture, the surface soil above it has a greater reserve from which to draw during a dry spell. This constitutes the superior advantage of plot No. 2, and, other things being equal, plot No. 2 should contain a much larger per cent of moisture, especially in a dry spell, since No. 1 has a very poor reserve supply on which to depend.



Noting now the upper diagram, we observe that No. 2 begins with a higher per cent. of moisture, and keeps the advantage during the month of June. On June 28th a slight rainfall has a depressing effect on the uncultivated plot, while careful cultivation on the other plot succeeds in preventing evaporation, and on July 1st, for the first time, the cultivated plot comes to the fore. Between July 5th and 17th considerable rain falls, and the more compact subsoil belonging to No. 2 helps in preventing this water from leaching away. Consequently, at this period the curve of No. 2 comes again to the top, but it soon loses this advantage, and after August 4th, and all through the extreme drouth of August, the curve of No. 1 stands above the other. Without surface cultivation, the opposite would undoubtedly have been the case.

These results confirm those of last year as to the importance of frequent shallow cultivation during dry weather.

We find also that where the crop has not a good retentive subsoil, from which to draw reserve supplies of moisture in dry weather, surface cultivation will partly or wholly compensate for this deficiency

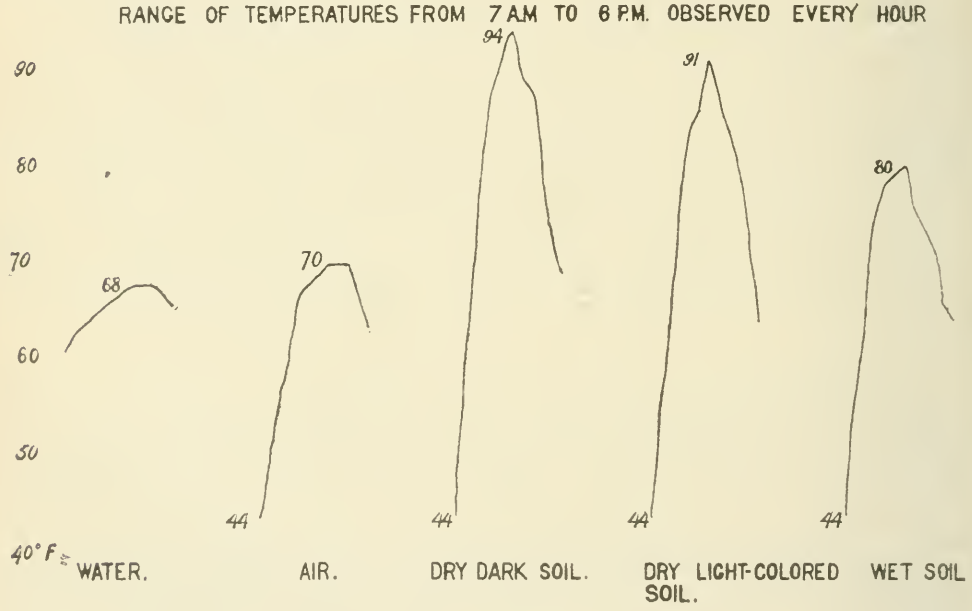
In practicing surface cultivation it is important to stir the soil as soon as possible after a shower, else, the mulch being destroyed by the rain that has fallen, evaporation will go on so rapidly as to leave the soil, in a very short time, drier than before the rain.

Some Observations on Soil Temperatures.

The accompanying chart shows the results of one day's observations on soil temperatures. It is given here for the sake of two practical conclusions that may be drawn from it.

Some soils in large pans were set in the open air, near a large body of water, and the temperatures of the soils, the air, and the water, were observed each hour, beginning at 7 a.m. and concluding at 6 p.m. They were all exposed to the action of the sun's rays. The water rose from 61 to 68, reaching 68 at 2 p.m. It then fell to 66 by 6 p.m. The air rose from 44 to 70, reaching its highest at 2 p.m., and then fell by 6 o'clock to 63.5. The soils all began at the same temperature as the air, namely 44; all the soils reached their maximum at one o'clock, and from that time declined rapidly. The highest temperature reached by the dark soil was 94, by the light colored soil 91, and by the wet soil 80.

The practical points illustrated by the above differences are: *first*, the advantage of *thorough draining*, and secondly, the advantage of having *a sufficient supply of humus*, in the soil.



Quick Germination.—Badly drained land remains wet and therefore cold for a long time in the spring. This wetness prevents early seeding, and prevents quick germination after seeding. This year, in connection with our co-operative work, we have demonstrated, in a number of tests, that early sprouting is followed by a better crop than late sprouting. Our chart shows that a dry soil goes from 11 to 14 degrees higher than a wet soil under the same circumstances. Heat is necessary to rapid germination. Hence to insure a *quick germination*, the *surplus water* must be *drained* from the soil in the spring.

Secondly other things being equal, the *dark soil will be warmer* than the light-colored soil. In our diagram, we see that the dark soil rises 3 degrees higher than the other, both being dry. Now the *dark color* is imparted by the *vegetable matter* in the soil, and the light color indicates an absence of humus or vegerable matter. And while humus is added to the soil principally because of the plant food it furnishes, it can be seen that it confers other important benefits in helping to warm the land in the spring, and hence in hastening germination.

Protection from Lightning.

A correspondent calls our attention to the fact that considerable destruction of property is being wrought by lightning, and inquires as to the steps being taken by a community in insuring proper protection from this source of danger.

The relative destruction of property in the country districts is immensely greater than in the towns. Isolated barns and houses, with few or no trees near to avert or divide the force of the stroke, are much more liable to be struck than town buildings. On August 12th, severe thunderstorms passed over various parts of the Province, and the detailed reports of the same, as given in two of the Toronto daily papers, are as follows:

Near Lindsay, barns containing grain from 100 acres struck and burned. Victoria Road, barn and contents struck and burned.

Penetanguishene, lumber yard struck and partially burned.

Alliston, two large barns struck and burned with the year's crops.

Woodstock, barn struck and destroyed; the last of the season's grain just gathered in.

Near Barrie, barn struck and burned.

Near Colwell, residence struck and burned.

These are eight instances of destruction of property by lightning; six of them are barns. As these accounts are all that could be found relating to destruction of property in the two dailies of August 14th, it is fair to assume that 75 per cent. of the buildings struck in two days' storms, over an area including Woodstock, Barrie and Lindsay, are barns very likely isolated, and most if not all of them filled with the season's unthreshed grain.

In addition to these cases, a number of lives were destroyed, of men and cattle, on the same days and by the same agency. The distribution of these fatalities is both serious and interesting.

Near Lindsay, Township of Ops, some cows and sheep killed; Cameron Village, eleven sheep killed.

Near Picton, one person killed and two others severely shocked while in the field drawing in grain.

Near Brougham, one person killed while standing under a tree, seeking shelter from a storm.

In these there are no instances of fatality in a town, but all occurred either in the open field, or near objects which drew down the death-dealing bolt. On the same occasion several trees in the town of Barrie were struck, but there is no account of persons or buildings being struck. The apparent inference from the two events above recorded is that a tree may be a protection, if it is not too close.

Are Barns More Liable to be Struck when Filled than when Empty?

There is good reason for believing, from actual statistics and for other reasons, that barns filled with hay and unthreshed grain afford an easier path for a lightning discharge than empty barns do. According to a report of the United States Weather Bureau, the loss of barn property in the month of August is very much greater than in any other month of the year, although thunderstorms are not much, if any, more prevalent in August than in any other summer month. And August, both in the Northern States and in Canada, is the month of overflowing barns.

Is any Sort of Protection from Lightning Effective?

From the instances given above it may be inferred that buildings grouped together are mutually protective. The neighborhood of trees is also a safeguard if the trees are not so close to the building or person as to cause a side-flash. To be in the neighborhood of a tree may be safety, to be too near it or under it is danger.

Regarding protection of buildings by lightning rods, Sir William Thompson—Lord Kelvin—one of the greatest living authorities on this question, says: "We have strong reason to feel that there is a comfortable degree of security, if not of absolute safety, given to us by lightning conductors made according to the present and orthodox rules."

Professor Oliver Lodge, in his book "Lightning Conductors and Lightning Guards," says: "Almost any conductor is probably better than none, but few or no conductors

are absolute and complete safeguards. Certain habits of lightning-rod practice may be improved, and the curious freaks and vagaries of lightning strokes in protected buildings are intelligible without any blame attaching to the conductor; but this is very different from the contention that lightning rods are unnecessary and useless. They are essential to anything like security."

In a bulletin published by the United States Weather Bureau, the case of the Washington monument is cited as follows: "Eight years have now passed since the alterations were made, and the monument stands uninjured. Unquestionably, standing as it does 555 feet high, in the centre of flat, well-watered ground, it constitutes a most dangerous exposure for lightning flashes. No better illustration of the value of lightning conductors can be asked.

Professor Lodge gives the following rules for the erection of lightning conductors:

1. That iron is the best metal to use in conductors.

2. That conductors should be coutinuous, and that all unavoidable joints should be soldered.

3. That several points are preferable to a single point, hence ordinary barbed wire, as affording innumerable points, is recommended.

4. That greater surface than is usual with present practice, should be given to earth connections.

5. That periodic inspection is most important.

What Insurance Men say About Lightning Rods.

By corresponding with a large number of insurance companies in this Province, the writer has elicited some rather valuable opinions and facts regarding the protection of farm buildings by lightning conductors. The majority of these companies believe that lightning rods are a safeguard if properly put up, but add that they are often either badly installed or are allowed to get out of repair. All the companies corresponded with were unanimous in stating that they made no reduction in rates in favor of buildings protected by lightning rods. So that, whatever may be the possibilities of lightning rods as safeguards, the disregard of principles and the lack of thoroughness on the part of those who have had the work to do have made the system, in the eyes of practical men, of doubtful utility.

Summary.

1. An isolated object is more liable to be struck than a group of objects.

2. Barns are most likely to be struck when filled with grain or hay.

3. Trees afford protection to objects standing lower, unless the trees are too close.

4. Lightning conductors, when properly installed and kept in good repair, afford a good degree of security.

5. The essentials of a good lightning conductor are:—(*a*) numerous points—either as terminals or as projections of conductors. These give constant relief to the electric strain in the atmosphere and tend to prevent the accumulation of a destructive charge; (*b*) a continuous metallic conductor, with as few joints as possible. Unavoidable joints should be soldered perfectly. Imperfect joints, like ice on the overhead wire of an electric railway, cause flashes, and these flashes may set fire to the building; (*c*) a good earth connection, that is, the lightning rod should be conducted to moist earth below the perpetual moisture line. A good earth connection can be made by using a wire rope as conductor, opening out the ground end of the wire into a brush and spreading the brush over as large an area of earth as possible; or by splicing to the main conductor below the ground surface a number of wires running in different directions, so that one or more of them may be sure to be in contact with good earth.

6. Before intelligent farmers can be expected to expend their money in purchasing lightning rods, they must receive a reliable guarantee that the work will be properly done. A feasible arrangement might be the appointment of a county or township inspector, employed by the municipality to inspect in that municipality.

Report of Precipitation and Temperatures for the Year 1899.

The highest temperature recorded at the college for the year was 95° on August 19th. The lowest was 20.5° below zero, on February 12th.

The amount of precipitation for the year, including rain and melted snow, was very nearly 20 inches. Below is a table giving the precipitation for each month, and the highest and lowest temperature.

Month.	Temperatures.				Precipitation.
	Highest.	Date.	Lowest.	Date.	
January	48	5	—10	11	.68 inch.
February	46	27	—20.5	12	.77
March	61	22	1	21	2.00
April	80	29	18	4	1.00
May	78	1	31.5	15	3.10
June	86	5	42	10	.64
July	89	3	49	30	1.93
August	95	19	43	9	.24
September	85	17	28	23	3.00
October	76	13	25	3	4.10
November	57	18	22	12	.73
December	52	1	—13.5	30	1.58

Cold Storage and Refrigeration.

The time has come when the students in dairying and horticulture especially should be instructed in the principles of cold storage and refrigeration. If our graduates are to assume responsible positions in the fields of labor, in which, at the college, they have made a special study, they must be more or less familiar with modern methods of storing, preserving and marketing perishable products. In dairying and fruit-farming cold storage has become more or less of a necessity. Any instruction that is to be given in this matter, so far at least as the principles are concerned, must be given in the Department of Physics. I therefore take this opportunity of recommending that a refrigerating plant be installed adjacent to the college proper, to be used for the following purposes:

1. To provide cooling rooms for experiments in butter and cheese.
2. To provide cold storage in connection with the horticultural department.
3. To provide cold storage for the experimental feeding department, so that individual animals may be slaughtered at the right time, and the carcases kept until the whole batch is ready for scoring.
4. To provide cold storage accommodation for the College store-room.
5. To afford an opportunity for experiment and instruction on this subject, in the department of Physics.

If all of these interests were considered in one undertaking, a much more efficient plant could be installed than if two or three small affairs were built in connection with the several departments. This matter of a refrigerating plant will, I think, deserve your early attention.

I have outlined elsewhere the amount of instruction given in the department of Physics. Altogether, in English and Physics, my work is as follows:

First Year.—Two lectures a week in Physics, in the winter term. Two lectures a week in English Literature, throughout the year. Correcting occasional compositions.

Second Year.—Two lectures a week in Physics, with demonstrations that involve previous preparation of apparatus, throughout the year. Practical instruction in Physics, in addition to lectures, two afternoons a week for the whole year. Two lectures a week in English Literature. Correcting weekly essays, from October to February. After that time the second year students employ the time allotted to essays in writing their theses.

Third Year.—Two lectures a week in Physics in the fall term. Two afternoons a week in practical instruction for the year. Three lectures a week in fall term, and two a week in winter term, in English Literature. Correcting of essays prescribed in the circular. Directing students in original work required for the preparation of theses. I have four of the present third year conducting their theses work under my direction—two in Agriculture and two in Dairying.

There is a growing demand on my department for the analysis of soils, a demand coming from farmers in the Province. This work I am entirely unable to do in the winter time, when most of the samples are sent in. To be satisfactory, this work should be attended to promptly. Four soils were sent in a few days ago for analysis, but I could do nothing with them except to give a very general report. Since a physical analysis of soils reveals so much that is decisive, showing the texture, the degree of fertility, and the availability of plant food in the humus form, it is imperative that this department should be provided with the means for attending promptly to soil analysis.

In addition, I have been trying to carry on original investigations in soil physics during the summer. Last summer and the summer before, with the valuable assistance of Mr. R. D. Craig, B.S.A., whom a provisional appropriation enabled me to employ, experiments on the cultivation of the soil in relation to moisture were conducted. The results of this work are outlined elsewhere. The results of the co-operative experiments were obtained with the same assistance.

If the departments under my charge are to do the work that will be demanded of them, in lectures, demonstration, correcting of essays, analysis of soils, and original investigation, permanent assistance must be provided. In each of my last two reports I made a recommendation that a Fellow or an assistant be appointed to this department. Unless really valuable work for the College and the Province is to be neglected, this assistance should be provided at once. I hope that it will be possible for you to enable me to begin the next year with the departments under my charge well equipped for broad and useful service.

Allow me to thank you for the generous and hearty encouragement accorded to me personally, and for the liberal appropriations toward the purchase of apparatus and supplies.

Yours respectfully,

J. B. REYNOLDS,
Professor of Physics.

Ontario Agricultural College,
Guelph, Dec. 30, 1899

PART IV.

PROFESSOR OF BIOLOGY AND GEOLOGY.

To the President of the Ontario Agricultural College:

SIR,—I beg to submit herewith my second report as head of the Biological Department.

The year 1899 was a busy one with this department. Regular and systematic instruction was given in four distinct branches, viz., Botany, Zoology, Entomology, and Geology; a large correspondence was conducted with persons asking help in the identification and treatment of insects and weeds; the fumigation method of treating nursery stock in the nurseries of the Province was inaugurated; consultations were frequently held with the scale inspectors regarding the identification of scales; a bulletin on the San José and other scale insects was prepared; experiments in the spraying of mustard, and the fumigation of granary insects were made; papers were read at the meeting of the Entomological Society of Ontario, held in London, October 11th and 12th; two short addresses were delivered to the students of the Toronto Normal School on "Nature Study;" and special studies were made on certain new insect and weed pests.

INSTRUCTION.

Laboratory work forms the basis of all instruction given in this department, and it should be borne in mind that such work done, even under most favorable conditions, throws a large amount of additional labor on the instructors.

The building at our disposal is wholly inadequate for the needs of the work. The lack of laboratory accommodation is perplexing and annoying, as the room is far too small, and is unsuitable for the purpose, hence the classes must be divided into sections and the work repeated. This repetition of work for different sections of the same class consumes the time and energy of the instructors, leaving no time for the preparation of next day's work, nor for correspondence, while research work and the reading of scientific magazines and bulletins are simply impossible. If two or more large and properly equipped laboratories were provided for this department, not only would the students get better instruction, but the instructors would also get the time which should be theirs, for reading and preparation.

The work of instruction is very onerous on account of the number of subjects to be taught. In the general courses two lectures are given every day to the First Year students; one lecture every day to the Second Year students; and one lecture every day to the Third Year students, throughout the year. In addition, courses of lectures are given in Cryptogamic Botany, Physiological Botany, Histology, Fungi and Fungous Diseases and Zoology to the specialists in Biology and Horticulture. Six lectures a day are delivered on the average throughout the year, while every afternoon and Saturday morning have their classes, which require constant supervision and preparation.

The First Year students get no practical laboratory instruction in Zoology or Geology; the Second Year and Third Year students do not have the amount of practical work in Entomology which is so desirable; yet it is difficult to see how the amount of practical work can be increased without additional room, time and assistance.

I may say, moreover, that a large portion of my assistant's time is devoted to the preparation of material in general Histology, and the Histology of Fungi and general Cryptogamic plants, which required the full time of an assistant when Prof. Harrison had the work in charge.

Correspondence.

This phase of our work has again assumed large proportions, and as a consequence much time and research are required. Over five hundred letters and two hundred circulars were sent out during the year 1899. This department is being freely consulted by the fruit growers, farmers and others in all matters pertaining to weeds, plant diseases, and insects, and frequently the nature of the inquiries necessitates considerable research and lengthy replies.

My assistant has had also considerable correspondence in connection with the distribution of sets of weed seeds, work which Prof. Harrison handed over prior to his leaving for Europe.

In consideration of the large correspondence, the demand for special articles on biological subjects by the agricultural press of the Province, and the various annual reports for the College, and the entomological and other societies, a typewriter would be of much service, and I would respectfully ask that one be secured for use in the Biological Department.

Fumigation of Nursery Stock.

On the passing of the Fumigation Act by the Legislature in April last, the Hon. the Minister of Agriculture asked me to take charge of the work of inaugurating the system of fumigation of nursery stock in specially constructed air-tight buildings. With the assistance of Professors Harrison, Reynolds and Shuttleworth, all the nurseries of Ontario were visited and the nurserymen instructed how to build suitable fumigating houses, and how to fumigate with hydrocyanic acid gas.

The chemicals used in fumigation were sent out from the College to the different nurseries in quantities suitable to the size of the various fumigating houses.

The work of inspection of the nurseries occupied nearly the whole month of April, and interfered to some extent with the closing weeks of the college term. The fumigation of nursery stock in the autumn also involved considerable time, and much correspondence was necessary to get information from many nurserymen as to the effects of fumigation on exposed stock.

Identification of Scale Insects.

During the progress of the inspection of the orchards of Ontario for the location of the San José Scale, many inspectors and orchardmen sent specimens of scale for identification. As official entomologist, I was obliged to be extremely careful in naming the scale sent, for sometimes much depended on my report. In every case the specimens of scale were subjected to treatment to render them transparent and suitable for examination with the high powers of the microscope.

The *Ostreæform Scale*, a recent importation from Europe, which had been previously reported from only a few places in North America, was found to be quite common in some sections infested with San José Scale. This work of identification of scales occupied most of my time during the months of August and September.

A Bulletin on the San José and other Scale Insects of Ontario.

The San José Scale Commissioners, who were appointed by the Government to inquire into the operation of the San José Scale Act in Ontario, made a recommendation in their report to the Government that a bulletin be prepared, which would give the main facts regarding the habits and life history of the San José Scale and other scales of our orchards. Accordingly the Minister of Agriculture asked me to prepare a bulletin along the lines suggested by the Commissioners for distribution to orchardists. This bulletin I have prepared, and have submitted to the Minister for approval. Illustrations of the common scales of the orchard have been made, so that the intelligent orchardist will be able, with the help of the descriptions in the text of the bulletin, to identify any scale which he may find in his orchard. This bulletin, I trust, will also be of use to the future inspectors of scale in our orchards, as I have inserted many items of information regarding scales, which will make them observe more intelligently and decide more confidently than they have hitherto been able to do. The work of identifi-

cation of scales in late summer and the observations made during my trip with the Scale Commissioners were of great service to me in the preparation of this bulletin.

Spraying to Kill Mustard, and Fumigation to Kill Granary Insects.

Several series of experiments were tried in England last year on the use of copper sulphate and iron sulphate solutions, applied in the form of a spray, for the eradication of wild mustard. Outlines of these experiments are to be found in the May 27th, June 24th, and August 5th issues of Field, the great English agricultural weekly. In the majority of these experiments, a weak solution of copper sulphate was found very efficacious.

During the past summer my assistant, M. W. Doherty, used a knapsack sprayer, and applied solutions of different strengths of copper sulphate and iron sulphate to mustard plants growing in a field of oats. Only one strength (1.25 per cent. solution) of iron sulphate was tried, with the result that the mustard was not entirely destroyed and no injury was done to the oat crop. A 4 per cent. solution of copper sulphate (4 lbs. of copper sulphate dissolved in 10 gallons of water) was found very effective in destroying the mustard, and caused very little, if any, injury to the grain crop; but a 2 per cent. solution of copper sulphate (2 pounds dissolved in 10 gallons of water) was found to be the best strength to use. The oats showed practically no injurious results from the application, even at the time of spraying, while the mustard was completely destroyed. Two weeks later the oats which had been browned slightly by the spraying were as bright and green as those of the unsprayed portions of the field; and when the sprayed oats were ripe the straw was over six inches longer than that which was unsprayed. It is probable that the best results can be secured when the mustard and oat plants are young.

During the coming summer the experiments will be repeated on a larger scale, and on several kinds of crops. A special spraying apparatus has been designed for the work, and it is probable that the machine will be placed on the market during the year 1900.

From the good results obtained by the use of hydrocyanic acid gas in the destruction of the San José Scale and other orchard insects, it was thought advisable to try the effects of the gas on grain-infesting weevils found in granaries. Two tall glass jars, with ground stoppers, and with a capacity of 625 cubic inches each, were used as air-tight compartments in which the insects were treated to the gas. In jar No. 1, which was kept beside a warm radiator in my office, was placed a package of corn badly infested with active grain weevil and cadelle. In the first experiment the insects were treated for three hours to the same strength of hydrocyanic acid gas as was used in nursery fumigation. In jar No. 2 a similar package of infested corn was placed and treated, but the insects had previously been rendered torpid by exposure to a cold of 40 degrees Fahr. for an hour. The gas treatment was continued for three hours at this temperature, and when the jars were opened and the insects taken out and brought into a warm room, fully 95% of those in jar No. 1 failed to show signs of life even after a period of 24 hours, while 95% of those in jar No. 2 revived and became active.

These experiments were repeated, using twice the usual strength of the gas. When the jars were opened at the end of 24 hours all of the insects in jar No. 1 were dead, while fully 10% of those in jar No. 2 showed signs of life, revived, and became active in again in 24 hours, although they had been exposed to a temperature of 14 degrees Fahr. for a whole day.

The results of these experiments show plainly that torpid grain insects are very difficult to kill with hydrocyanic acid gas, but that they can be killed readily in rooms warm enough to render them active. The use of this gas cannot, then, be recommended for winter treatment in either granaries or mills.

Papers Read Before the Entomological Society.

I attended the annual meeting of the Entomological Society of Ontario which was held in London Oct. 11th and 12th. The most prominent feature of the proceedings was a discussion of the San José Scale problem by Prof. Webster of Ohio, Dr. Fletcher of Ottawa, Mr. John Dearness, Deputy Minister James, Mr. G. E. Fisher and myself. At the conclusion a resolution was adopted expressing approval of the efforts made by the

Minister of Agriculture to rid the Province of the pest. I read two papers before the Society, entitled "Notes on Some Insects of our Coniferous Shade Trees" and "The Asparagus Beetles in Ontario." At a public meeting, held on the evening of Oct. 11th, I gave an address on "Insect Pests of the Garden, Orchard and Farm," which was illustrated by stereopticon views of the insects discussed. The Society honored me by electing me Vice-President and a member of the editing staff of the *Canadian Entomologist*.

Nature-Study.

In my report of last year I stated as follows: "The present drawback to the introduction of nature study into the public schools lies in the fact that the majority of teachers in rural schools are not sufficiently equipped for the work of instruction. To overcome this difficulty, leaflets might be prepared by this department and issued to teachers to show how Nature-study may be presented to the pupils." These words still hold true in so far as the equipment of the teachers for the work is concerned; but there are indications that point to an improvement along those very lines in the near future. The teachers of the normal schools of the Province are interesting themselves in the work, so that ere long courses of nature-study for teachers will likely be given. One teachers' association has taken the work in hand, and is endeavoring to organize a summer course of study in elementary botany, entomology, geology and physics. Another teachers' association has provided its members with the best works on nature-study, and has had special lessons on nature topics taught from them. The agricultural papers of the Province are publishing articles on Agricultural Instruction, which will be widely read by the farmers.

In furtherance of the great scheme of nature study, I had the honor of giving two talks on insects to the students of the Toronto Normal School on the occasions of their visits to the college, one practical lesson on evergreens to the Guelph city teachers, and another practical lesson on the cabbage butterfly to the pupils of the Marden public school, Wellington county.

I have also prepared an illustrated nature-study leaflet on the cabbage butterfly, which will appear in the forthcoming annual report of the Entomological Society.

Prof. C. C. James has happily said: "Keeping close to nature as it is right at home, in the fields, along the roadsides, in the running brooks, looking for the simple workings of laws all about us, not trying to fathom the far-aff problems of some remote science; starting right at our feet with the simplest things of life about us, and getting down to the explanations of so-called common things, is the key to the situation." To do this there must be intelligent, enthusiastic teachers, who can make the common things of nature plain and intelligible to the pupils. It is the duty of this college to further this grand work of indirect agricultural education, not only by giving practical lessons to teachers and classes of pupils, but also by furnishing information about the common objects of nature in the form of leaflets.

New Insect Pests of the Year 1899.

Several insects made their appearance in Ontario in somewhat alarming numbers, and many inquiries were made as to the best methods of dealing with the new arrivals. I shall now treat very briefly of a few of the worst.

(1) The Asparagus Beetles (*Crioceris asparagi*) *and* (*C. duodecempunctata*). In 1898 the arrival of these beetles at the Niagara River was noted, and it was then predicted that they would soon be with us.

For over forty years these pests of asparagus have molested the market gardens of certain portions of New York State, especially Long Island. In 1862 the common asparagus beetle (*C. asparagi*) occasioned the loss of over one-third of the crop in Queens County, the loss being estimated at $50,000.

These two beetles arrived in Ontario at the same time, although they had different starting points and were introduced into the United States at different times. At present the common asparagas beetle is the more abundant and destructive.

Fig. 1, shows very clearly the form and markings of the beetle, egg, larva, and pupa, of the common asparagus beetle (*C. asparagi*). The beetle is blue-black in color, with red markings on the thorax and wing covers, and passes the winter under sticks and rubbish on the ground. About the first week of May it leaves its winter quarters and deposits eggs on the fresh, succulent shoots of asparagus. The eggs are placed in rows of

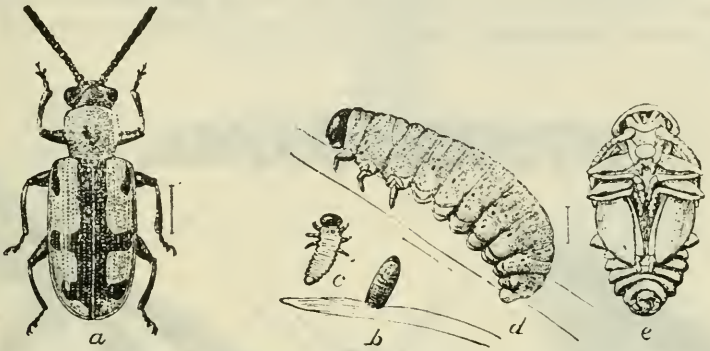


Fig. 1. Asparagus Beetle (*Crioceris asparagi*); *a*, adult beetle; *b*, egg; *c*, young larva; *d*, larva, full-grown; *e*, pupa. (Chittenden, Year-book of Dept. of Agriculture for 1896.)

four or five, are nearly one-sixteenth of an inch long, and are dark-brown in color. The eggs hatch in about a week; the bodies of the grubs are gray; the head and the three pairs of legs are black. In twelve days the grubs are full-grown, when they enter the ground, surround themselves with a cocoon and become pupæ. In another week the adult beetles emerge. It will be seen that about 30 days are required for this beetle to develop rom the egg to the adult stage.

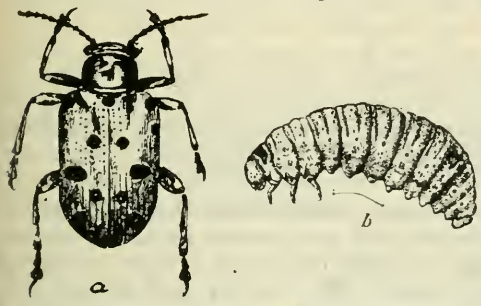


Fig. 2. Twelve Spotted Asparagus Beetle (*Crioceris 12-punctata*); *a*, adult beetle; *b*, full-grown larva.

Fig. 2 shows very clearly the form and markings of the twelve-spotted asparagus beetle (*C. 12-punctata*), and its larva. The beetle is orange-red in color, with black markings on the wing covers. The grub or larva when full-grown is about one-third of an inch long, and of an orange color. The life-history of this species is not yet thoroughly known, but it is generally supposed that the eggs are deposited on the stems of the asparagus. These beetles, like those of the other species, feed upon the stems and leaves.

Remedies.—(a) The Long Island practice is to "cut down all plants, including seedlings and volunteer growths, in early spring, so as to force the parent beetles to deposit their eggs upon new shoots, which are then cut every few days before the eggs have time to hatch from the first brood."

(b) Some permit shoots to grow as trap plants which are cut down every week so as to destroy the eggs deposited upon them.

(c) Insecticides are frequently employed when neither of the first two remedies is practicable. The best applications are lime, pyrethrum powder, and paris green. The lime should be fresh, and air-slaked; the paris green may be mixed with flour, and applied dry to those shoots which are left uncut. All shoots should be treated with paris green after the cutting season.

(2) The Diamond-Back Moth (*Plutella cruciferarum*) was quite destructive to turnips in several localities. Although not a new arrival in Canada, this is the first time that its occurrence in Ontario has been noted in large numbers, and over a large area.

The caterpillars are green in color, and are beset with short jet-black hairs. When full grown they are nearly half an inch long. They eat holes in the leaves, which soon become very tattered and torn. A very characteristic feature of this insect is the thin gauzy cocoon, which the full-grown caterpillar spins on its changing into the chrysalis.

Dr. Fletcher reported an outbreak at Ottawa in 1889. From the observations made then he was led to believe that there are probably three broods each year, and the last brood passes the winter in the chrysalis state. Experience with this pest in England and the United States has proved that it may be very troublesome one year, and difficult to find the next. In Canada, it was very abundant at Victoria, B. C., and Winnipeg, in 1885, but has not been reported as serious since. It was quite serious at Regina in 1887, and at the Ottawa Experimental Farm in 1889, but not reported as serious from those districts since.

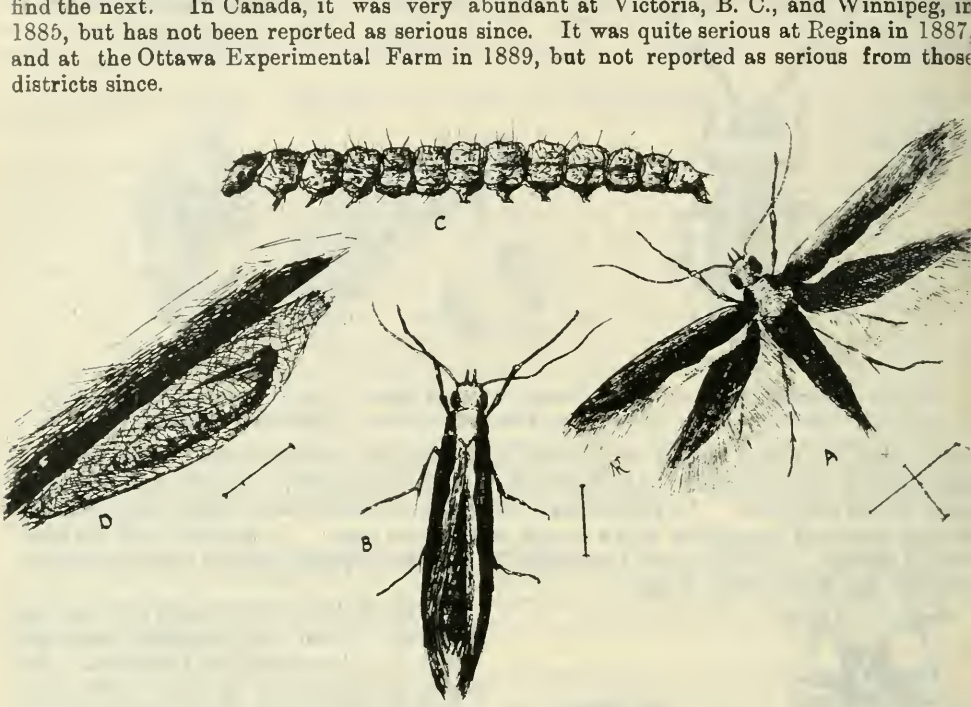


FIG. 3. *Plutella cruciferarum* (Diamond-back Moth); *a*, moth, showing the long hairs on the wings and the markings; *b*, moth with wings folded, showing the diamond-shaped area; *c*, larva or caterpillar; *d*, gauzy cocoon with chrysalis within. (Original.)

Remedies.—Remedial treatment is never absolutely effective when large fields of turnips are infested. The treatments which have met with the greatest amount of success in England are: (a) Swish off the caterpillars from the leaves with a stick, and spread broadcast by hand a liberal supply of gas-lime or soot. (b) Dust dry upon the leaves an application of paris green mixed with either flour or land plaster, whenever young turnips are effected by the first or second brood of caterpillars.

(3) THE PEA LOUSE.—There was an outbreak of this pest in York County in the last week in July. A correspondent wrote as follows:

"I have about eighteen acres of peas smitten with lice, and I do not think they will fill. The lice are much like the turnip lice, and occur in large spots where the stems are dying. I would like to know what is best to do with them." So far as I am aware this is the first recorded occurrence of a louse affecting peas in Ontario. As I did not see the infestation, I cannot tell which species was doing the damage. Prof. Johnson of Maryland reports a terrible outbreak in that state during the past summer, the loss being estimated at over $3,000,000.

"The standard remedy for plant lice, and plant-bugs is kerosene emulsion; and as the pea and bean infesting species feed chiefly on the under sides of the leaves of these plants an underspraying is necessary."

(4) THE CORN APHIS OR LOUSE (*Aphismaidis*). Ordinarily this louse is not troublesome, but during the drouth of the months of August and September corn was seriously affected by it. Fig. 4 shows the appearance of this louse. When plants have become weakened by drouth or otherwise, they become very susceptible to attacks from plant-lice and other parasites.

FIG. 4. *Aphis maidis* (Corn Louse); *a*, winged female; *b*, wingless female; *c*, pupa. (After Forbes of Illinois.)

Remedy.—No direct, practicable remedy has yet been found for the prevention of the ravages of the corn louse. Good farm practice, however, will do much towards lessening the extent of the depredations of plant-lice in general, for it is a well-known fact that healthy, vigorous plants are seldom injured by these insects. Whenever plants become weakened in vitality from lack of fertility, drouth, or neglect, plant-lice are very liable to appear in large numbers. "Therefore, if the farmer gives special attention to the fertility and drainage of his land, procures the best seed, and, by proper planting and cultivation, secures vigorous plants from the start, and by proper care endeavors to keep them in this condition until the product is matured, he will have accomplished more in preventing loss from insect depredations than he would accomplish by the best remedies known, applied to half-starved, neglected plants."

NEW WEED ARRIVALS.

(1) A very serious pest has made its appearance in the south-west counties of the Province within the last few years. I refer to the PRICKLY LETTUCE (*Lactuca scariola*).

This is an annual weed which has been introduced from Europe, and has spread to all parts of the United States. It is a winter annual; it springs from seed in the fall, and survives the winter. It is distributed by means of its seeds, which are readily blown long distances by the wind. The plant begins to bloom in July, and produces a few blossoms each morning thereafter until killed by frost. An average plant has been estimated to bear 8,000 seeds.

The best methods of destroying the weed are:

(*a*) To mow repeatedly as it comes into bloom, or earlier. This process will eventually subdue it.

(*b*) To cultivate thoroughly with a hoed crop; by this method the seeds in the soil will be induced to germinate. They should not be covered deeply in plowing, as this would simply bury the seeds and prevent them germinating. Mature plants should be cut down and burned, lest the seeds be blown about and scattered by the wind.

Farmers should be careful to buy only clean clover, millet, and grass seeds, and the weed-inspector should insist on the fulfillment of the law, and have all fence-corners, roadsides, and waste lands cleared of the pest.

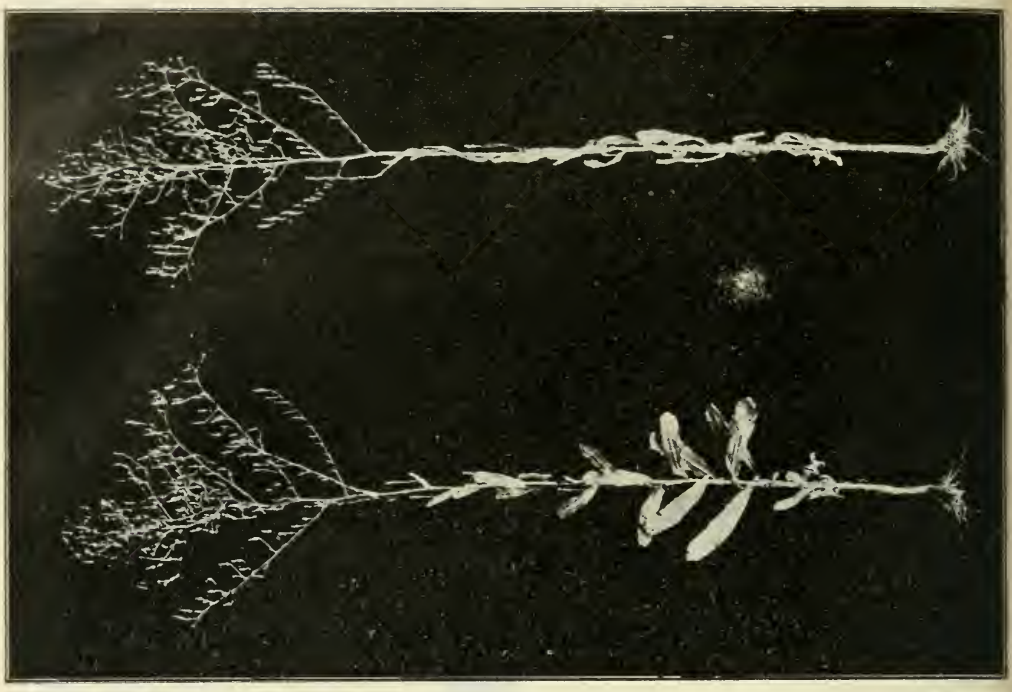


FIG. 5. Two views of *Lactuca Scariola* of the usual form, showing the compass-like habit of the leaves. To the left a view from the east (or west) side, as the plant grew, to the right a view from the north (or south) side of the same plant.

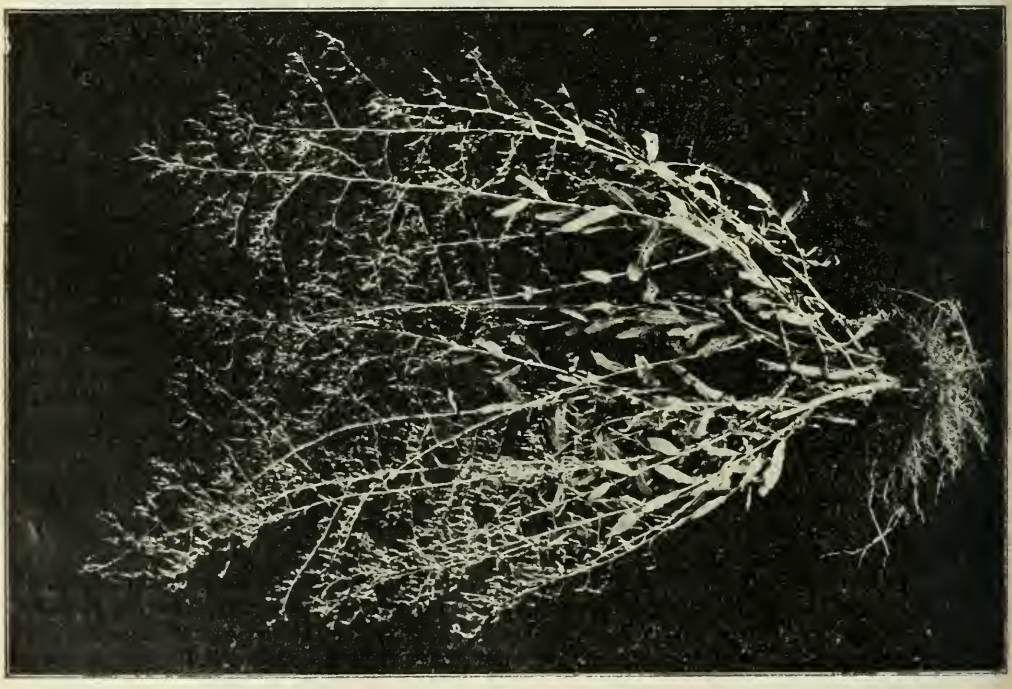


FIG. 6. A plant of *Lactuca Scariola*, which had been mowed off. It is readily seen by comparing with Fig. 5 that the branches have started from the base of the stem as a result of the mowing.

The plant may be recognized from figures 5 and 6. The leaves are clasping; the heads are numerous in an open panicle; the rays of the flowers are yellow; and the pappus is white.

(2) The Broad Leaved Gum Plant (*Grindelia squarrosa*), Fig. 7, has appeared in one or two places in Ontario. It is a native of the western plains from Manitoba to Mexico. The plant resembles a wild sunflower, but it is very gummy and sticky. The heads are yellow and nearly an inch across. It is propagated by its roots and seeds; and as it is a perennial it must be dealt with accordingly. The plants should be prevented from seeding by mowing repeatedly. When the weed becomes a pest all lands not in grass should be gang-plowed quite shallow after harvest, and cultivated as often as necessary in the fall to keep the weeds down. A hoed crop the following season should destroy most of the gum-plants and any annuals that are near the surface.

Fig. 7. Broad-Leaved Gum Plant (*Grindelia Squarrosa*), a piant whioh had been mowed off at *a*. The branches have started from the base as a result of mowing off. (Original).

The Needs of the Department.

This department is laboring under several serious disadvantages, some of which I outlined in a previous section of this report. Briefly, the needs of this department are:

1. A larger laboratory for the first and second year students.

2. More time for practical work in entomology, geology, and zoology. In the case of the first year, one afternoon every week during the winter term should be devoted to practical exercises in zoology and geology.

3. Better facilities for museum studies. The museum is too far removed from the class-room and laboratory to be of much practical value.

4. An insectary for the study of the life-histories of insects. Where the department is doing the work of an experiment station a good serviceable building of this kind becomes an absolute necessity.

5. A special laboratory for practical exercises and investigations in physiological botany.

6. A class-room for our own use. At present the lectures to the third year are given in the bacteriological lecture room, for the reason that the biological lecture-room is occupied by a class in horticulture.

In conclusion, I wish to place on record my appreciation of the valuable services not only of my assistant, Mr. M. W. Doherty, who has shown himself to be a willing worker, a good botanist, and a capable instructor, but also of Mr. D. H. Russell, a student of the first year, whose artistic abilities have enabled me to illustrate quite fully the San José Scale bulletin, and other articles in the annual reports; and of Mr. Norman Ross, B.S.A., whose skill as an illustrator is well and favorably known at the Ontario Agricultural College.

All of which is respectfully submitted.

WILLIAM LOCHHEAD,
Professor of Biology and Geology.

Ontario Agricultural College,
Guelph, December 30th, 1899.

PART V.

PROFESSOR OF CHEMISTRY.

To the President of the Ontario Agricultural College :

SIR,— In submitting my report for the year 1899, I beg to express to you my pleasure with the condition of the Chemical Department upon my return from Germany in December, 1898. During my absence of some twenty months the work of my department, under the direction of Mr. Robt. Harcourt, assistant chemist, appears to have been well done.

I have pleasure in submitting to you in this report (1) a brief statement of a new method of ash determination ; (2) grain experiments, in which oats, barley, wheat and peas were grown in soil receiving moisture through surface application, and through capillarity from below ; (3) analysis of sugar beets. My report also contains a valuable article from Mr. Harcourt, entitled " The Value of Gluten in Flour."

THE VALUE OF GLUTEN IN FLOUR.

The cereal grains and the preparations made therefrom form the most important part of human nutrition. Among all civilized nations, bread, in the broad sense, is the basis of human nutrition. Not only is it the most important, but at the same time it is the cheapest, for, measured by its nutritive value, there is no food so nearly a complete ration that, in economy, can be compared with bread. In it are found the proteids which go to the formation of flesh ; the carbohydrates, of which starch is the most important ; the fats and oils, which go to produce fat, heat and mechanical energy ; and the phosphoric acid, lime, potash, and other mineral constituents which are necessary for the formation of bone. There is no tissue of the body which cannot be nourished by bread, especially if it be made from the whole wheat flour.

" There are many substances from which the material for bread-making may be obtained. Wheat, corn, rye, barley, oats, buckwheat and potatoes have all been used for making bread. In fact, nearly every plant furnishing a product rich in starch has been used for this purpose. The two constituents which are found in largest quantities in the cereals are the starches and proteids, the former averaging about 60 to 70 per cent. and the latter 9 to 12 per cent. So far as is known, the starches are chemically identical, and all may be detected by the same chemical action. The starch kernels, however, differ in size and shape and in their action towards ferments. The character, composition, and even the number of proteids contained in the different cereals is not thoroughly understood ; but it is known that, owing to a peculiar property of the proteids of wheat flour, which it has in common with rye flour, it forms a dough when mixed with water, which, on leavening and baking, produces a light porous bread. This property of these flours is due to a difference in the composition of the proteids of the grains. They contain what is commonly known as gluten, a substance with which many of us are familiar in the form of a gum made by chewing wheat. The gluten from different varieties of wheat or from different parts of the same wheat may be very different in quality, some being firm and elastic, others soft and sticky. It is because of this gluten in wheat flour that when it is wet a dough is formed, and that when the dough is impregnated with a ferment or any gas-producing substance, the dough rises. The height to which the dough will rise depends largely on its ability to retain the escaping gases,

or upon the toughness and elasticity of the dough, which in turn depends upon the quantity and quality of the gluten. It will thus be seen that the gluten content of a flour has a great deal to do with the quality of the bread.

A commercial examination of a flour takes into account three things, namely, strength, yield and color. Flavor is so much affected by the modes of working the flour that it can hardly be considered in speaking of the commercial value. The *strength* largely depends upon the quantity and quality of the gluten, the *yield* of bread depends principally upon the amount of water the gluten will absorb, while the *color** of the flour is affected by the wheat from which it is made, by the amount of bran left in the flour, and by the amount of germ that escapes separation. It is evident, then, that the value of a flour, apart from the color, depends almost entirely upon the gluten it contains. In view of the immense amount of flour used, it is surprising that so little study has been given to the subject of flour in its relation to bread-making. During the past year we have done some work in determining the gluten content and bread-yielding power of a few of our Ontario varieties of fall wheat, and while no definite conclusions have been reached regarding comparative values, it is quite apparent that quality in gluten is almost, if not altogether, as important as quantity.

Climate and soil have a great influence on the character of wheat; apparently there is as great a difference in the strength of flour made from the same variety of wheat grown in favorable and unfavorable seasons as in the strength of samples from different varieties of wheat, while change of soil may almost entirely change the nature of the wheat. A fertile soil and a comparatively short season of growth are the most favorable to the production of a wheat with the highest and best quality of gluten. A long-growing season is favorable to the production of a large, plump grain, rich in starch. A short, quick-growing season forces the crop on the side of gluten formation, as less time is given to the filling out of the kernel with starch. It is, no doubt, true that the way the plants have wintered also affects the gluten content. When it is remembered that environment, as climate and soil, may force the wheat crop to produce starchy or glutinous seeds, that the stage of ripeness, the quality of gluten, and the ferment bodies, all give character to the grain; and, also, that when the wheat is milled a mechanical separation of the proteids takes place, it is evident that there are a great many factors which go to determine the character of the wheat and the quality of the flour. This is no doubt the cause of the differences of opinion among millers as to what wheats should be grown. Not long ago a prominent Ontario miller said that farmers should grow the varieties of wheat which would give the largest yield and the proper color, and pay no attention to the gluten content. At the same time, another equally prominent miller declared that unless farmers would grow wheats rich in gluten, irrespective of yield, the milling business in Ontario would be ruined. There is the same difference of opinion regarding the appearance of the best wheats for flour. Some millers prefer the gluey-looking, opaque kernels; others, the fine, white, transparent grains. Practically so little is known with any degree of certainity that there is here a wide field for the investigator.

Millers are complaining that Ontario wheat does not make so strong a flour as it formerly did. The same complaint is now being heard regarding the wheat from Manitoba and the North-West Territories. It is also not uncommon to hear farmers remark that their flour does not make so good bread as it did a number of years ago. At the same time, while certain varieties of wheat are spoken of as deteriorating, it is claimed that some of our soft winter varieties are improving in the quality of gluten. An effort is being made to study the change in the gluten content of wheats grown on newly broken ground and on ground that has been cropped for a number of years, to see whether the difference is one of quality, or quantity, or both; also to see if there is any possibility of of preventing the deterioration.

R. HARCOURT.

*The market at present demands a flour that will make a white, porous bread, irrespective of nutritive value or gluten content. This demand is so pronounced that a wheat which makes a dark flour, no matter how rich it may be in gluten, cannot be used for bread making. The Wild Goose wheat is a good example of such wheats.

A New Method of Ash Determination.

It is important to the science of agriculture to be able to make an accurate determination of the percentage of ash contained in plants, grasses, grain, and other agricultural products. The ash contains the lime, potash, phosphoric acid, etc., collected as plant food from the soil by the growing plant. How much ash each different kind of crop takes out of the soil, and what quantities of the various constituents are contained in this ash are questions closely related to soil fertility and soil exhaustion, which can be answered only by an accurate ash determination and analysis.

A quantitative determination of ash percentages is difficult to make, and errors which careful chemists find difficulty in avoiding, are easily introduced. The high percentage of carbon contained in the above products, the difficulty experienced in burning off all the carbon, the tendency of certain constituents to volatilize and of the ash to fuse, are the principal causes of this difficulty.

The usual method practised consists in incinerating an accurately weighed sample in an open platinum dish which has been previously weighed. The increase in the weight of the dish due to the ash which it contains, after the incineration of the substance, represents the crude ash. The percentage which this weight of ash forms of the weight of the weight of the original substance can be readily calculated But ash thus prepared may not contain all the phosphoric acid and potash of the original substance from which the ash was obtained. It also contains more or less carbonic acid, unburned carbon and foreign matter (sand, &c.), none of which form part of the ash of the plant. Owing to the presence in the ash of one or more of the above-named substances, viz., carbonic acid, carbon and sand, it is called crude ash. Too frequently percentages of ash are reported as crude which may be more than the real ash of the substance incinerated. To these sources of error may be added the previously mentioned tendency of certain constituents to volatilize, the absorption of moisture from the air during weighing, and the formation in the ash, during incineration, of silicates, which substances seriously interfere with the analysis of the ash.

To obtain a method giving accurate ash percentages and analysis, I conducted an extensive series of analyses of natural products (straw, hay, grain, &c.) and artificial silicates. In these analyses attention was given first to the determination of the percentage of crude ash in a sample of oat straw by the ordinary method of incinerating the dried material in an open platinum dish. During the process, different degrees of heat were employed with different samples. Those samples receiving the highest heat yielded the lowest percentages of ash, and those gently heated yielded the highest. But the ash prepared by the high heat yielded high percentages of silica and low percentages of potash, while ash prepared by the low heat yielded high percentages of potash and low percentages of silica. An analysis of the silica separated from the highly heated ash showed that it (the silica) contained portions of the other ash constituents, viz., lime, magnesium, potash, &c. This circumstance led me to prepare mixtures of pure silica, potassium, carbonates, and calcium carbonates of known quantities, which, after moistening with nitric acid and drying, were subjected to different degrees of heat corresponding to the conditions in regular ash determinations by the ordinary method. An analysis of these mixtures, after heating, gave results quite similar to the results of the analyses of the above samples of ash prepared from oat straw, *i. e.*, the highly heated mixture yielded high percentages of silica, owing to the lime and potash of the mixture uniting with the silica and forming silicates, which are indecomposable in hydrochloric acid.

After trying numerous substances, I found that the addition of a solution of acetate of lime to the dry substance prevented the formation of indecomposable silicates during incineration at any temperature. The formation of indecomposable silicates being prevented by the use of the acetate, ash can be prepared which is quite decomposable in hydrochloric acid ; and, consequently, accurate silica determinations can be made.

The loss of chlorides in incineration by the ordinary method has for many years been known, and numerous devices to prevent the loss have been proposed by chemists. While the quantity volatilized has been, by certain precautions, considerably lessened, its entire prevention has never been accomplished in the ordinary method of ash determination. A careful study of this source of error, viz , volatilization of chlorides, led me to design a special form of apparatus (see Fig. 1.) composed of platinum and provided with lids, cylinders and open-

ings in which the material moistened with acetate of lime solution and dried can be completely incinerated without the slightest loss of chlorides.

It is difficult to weigh fresh ash without alteration of its weight due to absorption of moisture from the air. This source of error in ash determination is entirely obviated by the freshly incinerated ash being weighed within my closed ash apparatus.

By removing certain parts of the apparatus, Fig. 1., it may be immediately connected after weighing with drying tubes and potash bulbs, as in Fig. 2., for the determination of carbonic acid in the ash, without the removal of the ash to a special carbonic acid apparatus.

Sample carefully and grind the steam-dried material to a uniform powder, which may be preserved in a tightly stopped bottle.

Two to three grains of this prepared and bottled sample are weighed for a moisture determination.

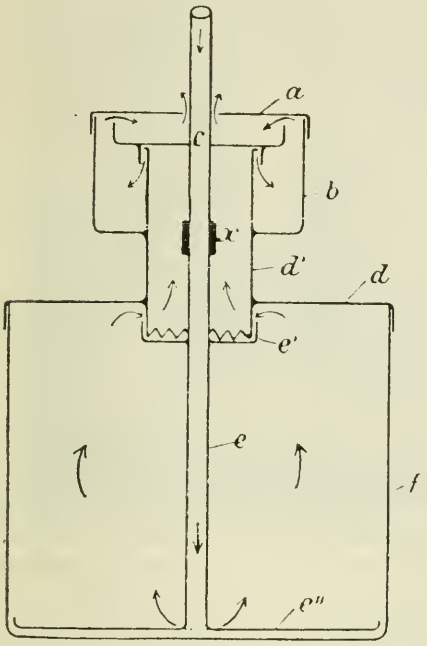


Fig. 1.

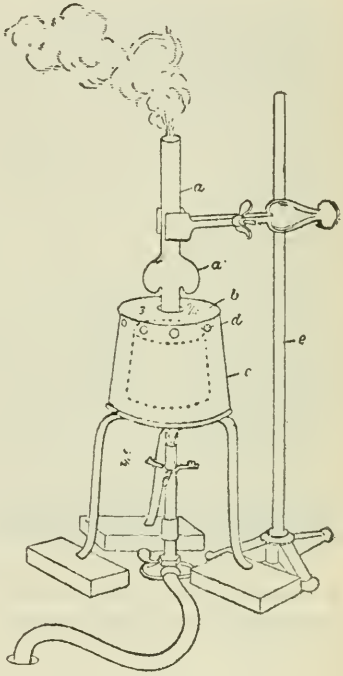


Fig. 2.

Ten to fifteen grains are next weighed into the previously weighed ash apparatus, Fig. 1, and moistened with twenty or more cubic centimeters of calcium acetate solution. The deep dish, or principal part of the apparatus which contains the weighed and moistened sample, is fitted into the charring oven, Fig. 2, where the sample is first dried and then charred to a gray ash at a very low heat. The drying and charring should not require more than three hours. The other parts of the ash apparatus are now carefully fitted together, enclosing the gray ash which, as in Fig. 3, is incinerated to a white or grayish white ash. The apparatus containing the ash after cooling is again weighed, to obtain by difference the weight of the enclosed crude ash. Leaving the ash in dish, certain parts of the apparatus are cleaned of adhering ash and laid aside while the dish containing the ash is connected, as in Fig. 4, with the drying tubes and potash bulbs for a carbonic acid determination. The dish containing the dissolved ash and separated silica is again placed in the charring oven, Fig. 2, where the ash in the presence of hydrochloric acid is evaporated to dryness. After taking up with concentrated hydrochloric acid, warming, and diluting, the silica is collected upon a Gooch crucible, dried and weighed. The filtrate containing the other constituents of the ash is analysed in the usual way. The crude ash minus the carbonic acid equals the carbon-free ash

GRAIN EXPERIMENT:—SURFACE AND SUBSOIL OR UNDERGROUND MOISTURE.

Early in May last, a cart load or two of surface soil from a farm field where roots were grown the previous year, was thoroughly mixed to be used in a grain experiment. Ten cylinders of galvanized iron, 12 inches in diameter and 3 feet long, were placed in two rows upon the ground, and filled with the soil mentioned above, each containing practically the same weight of exactly the same soil. These cylinders

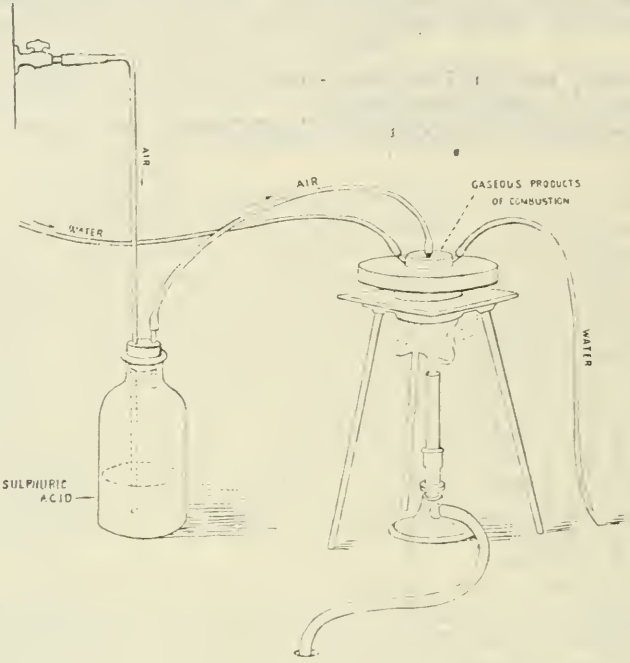


FIG. 3.

contained bottoms constructed for retaining water which through little holes could enter the cylinder, moistening the soil. A cotton sheet containing circular holes was stretched over the cylinders in such a manner as to expose only the surface of the soil to the sun. A cotton roof was also provided, which being pulled down over a frame entirely protected the plants and soil during storms.

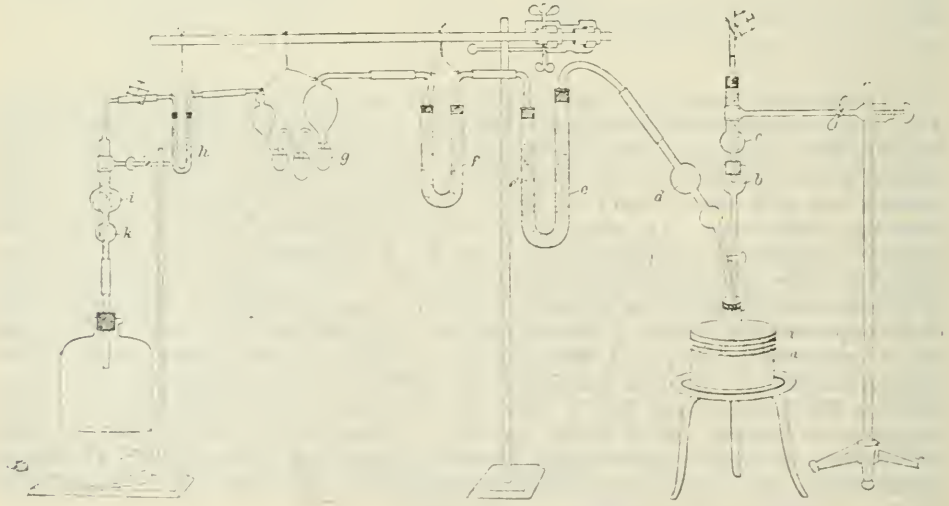


FIG. 4.

Fig. 5 illustrates the experiment on the 3rd of August, when the grain was beginning to ripen.

Cylinders marked 1, in Fig. 5, contain oats; those marked 2, barley; those marked 3, wheat; and those marked 4, peas. There are, therefore, two of each kind. In every instance, the cylinders to the left, facing the experiment at the end by 1, are supplied with water at the bottom, while those to the right are watered at the top. The surface, or top-watering, represented rain and was repeated whenever the soil appeared dry, while the bottom-watering represented an abundant supply of ground-water. No manures were used. All grains were sown on May the 8th, when the soil was nicely settled and moist. The young plants began to appear above ground in four to five days, that of the surface-watered soil appearing from twenty to thirty hours before that of the bottom-watered soil.

Fig. 5. (1) Oats, (2) Barley, (3) Wheat, (4) Peas.

The surface-watered oats, between the date of sowing, May 8th, and harvesting, August 26th, required watering 46 times, taking in all 43 lbs. of water; while, during the same period, 65¼ lbs. of water entered the soil in the other cylinder growing oats. The surface-watered barley, wheat, and peas required respectively 38½ lbs, 29¾ lbs., and 28 lbs.,—while the bottom-watered required, respectively, 25½ lbs, 34¼ lbs., and 104 lbs. of water. It was only in the case of the barley that the amount of water applied upon the surface exceeded the amount taken up at the bottom. In these latter kinds, as with the oats, surface watering had to be frequent, to prevent parching. Barley, having a comparatively shallow growing root, cannot draw upon the deeper soil moisture so well as oats, wheat, or peas; and this no doubt, accounts for barley suffering quickly in dry spells.

Surface and Ground Moisture in the Growth of Oats.

On August the 20th, the oats in cylinder 1 (a) were ripe, while those in 1 (b) were four days later in ripening. Fig. 6 shows that (a), the surface-watered oats, has produced less growth of straw than (b), the bottom-watered; but (b) shows a lighter root-growth than (a), which is in reality not the case. In removing the soil from the roots without breaking the rootlets, greater difficulty was experienced in these soils which had been watered from below. The total growth, in the case of (a), amounted to 67.66 grams, composed of roots, 10.63 grams; straw, 45.13 grams; and grain, 11.9 grams; while (b) amounted to 82.39 grams, composed of roots, 7.96 grams; straw, 56.93 grams; and grain, 17.5 grams.

SURFACE AND GROUND MOISTURE IN THE GROWTH OF BARLEY.

There was little difference in the growth, maturity, and yield between the surface and ground-watered barley. (a), surface, and (b), ground-watered barley are shown before harvesting in Fig. 5, and after harvesting in Fig. 7. The roots of barley (a) in Fig. 7, owing to an attempt to wash them free from earth, appear much less than they

(b) FIG. 6. (a)

are. The total yield of roots, straw, and grain, amounts in (a), surface-watered, to 45.59 grams; and in (b), ground-watered, to 45.34 grams. This experiment with barley shows the importance of the preparation of a seed-bed for barley, which supplies moisture in the surface soil, where the roots develop. Hence a spring-plowed soil cannot be expected to produce the best results in barley growing.

Surface and Ground Moisture in the Growth of Wheat.

It will be seen by reference to (b) and (a) of 3 in Fig. 5, and to (b) and (a) in Fig. 8, that the surface watered soil has grown a somewhat shorter but better headed crop than the other soil. The total weight of growth (roots, straw, and grain) is 29.95 grams on the former, and 26.62 grams on the latter soil. But while the sum of the straw and grain in (a), the surface watered crop, is 27 4 grams, and that in (b) is 23.5 grams, the roots of (b) are slightly heavier and better developed than (a). It is quite probable that the yield of crop on the ground-moistened soil, with a somewhat greater root growth, would have been greater than that on the surface-watered soil had not the blight injured the former, which matured more slowly, considerably more than the latter.

(b) Fig. 7. (a)

Surface and Ground Moisture in the Growth of Peas.

It is quite evident that the pea crop marked (b) in Fig. 9 and 4 (b), Fig. 5, is decidedly stronger and heavier than the other pea crop in the same Figs., which grew in the surface-moistened soil. The latter crop matured on the 15th of August and the former on the 22nd of the same month. The surface-watered soil yielded a total crop of 63 32 grams, consisting of straw, 39.05 grams; grain, 21.30 grams; and roots, 2.97 grams, while the soil moistened from below yielded a total crop of 116.6 grams, consisting of straw, 73.0 grams; grain, 38.5 grams; and roots, 5.1 grams.

It may be remarked that owing to the very little rain which fell during the period of this experiment the atmosphere for days in succession was dry and parching; and had it not been for frequent watering of the surface soil the crops supplied with moisture in this way would have suffered badly—the natural watering by rain would not have sustained anything like a satisfactory growth. "If the soil can supply sufficient moisture for

the crop's requirement its growth becomes, to a great extent, independent of summer rains. Humus in soil greatly increases its power to retain moisture, and cultivation of the right kind and at the right time contributes greatly towards the retention of moisture and aids in its movement through soil for the use of the crop.

The analysis of the grain and straw grown in this experiment is under way for the purpose of ascertaining the total quantity of the several ash constituents and nitrogen in each kind of grain, with their distribution between the straw and the grain.

(*b*) (*a*)

FIG. 8.

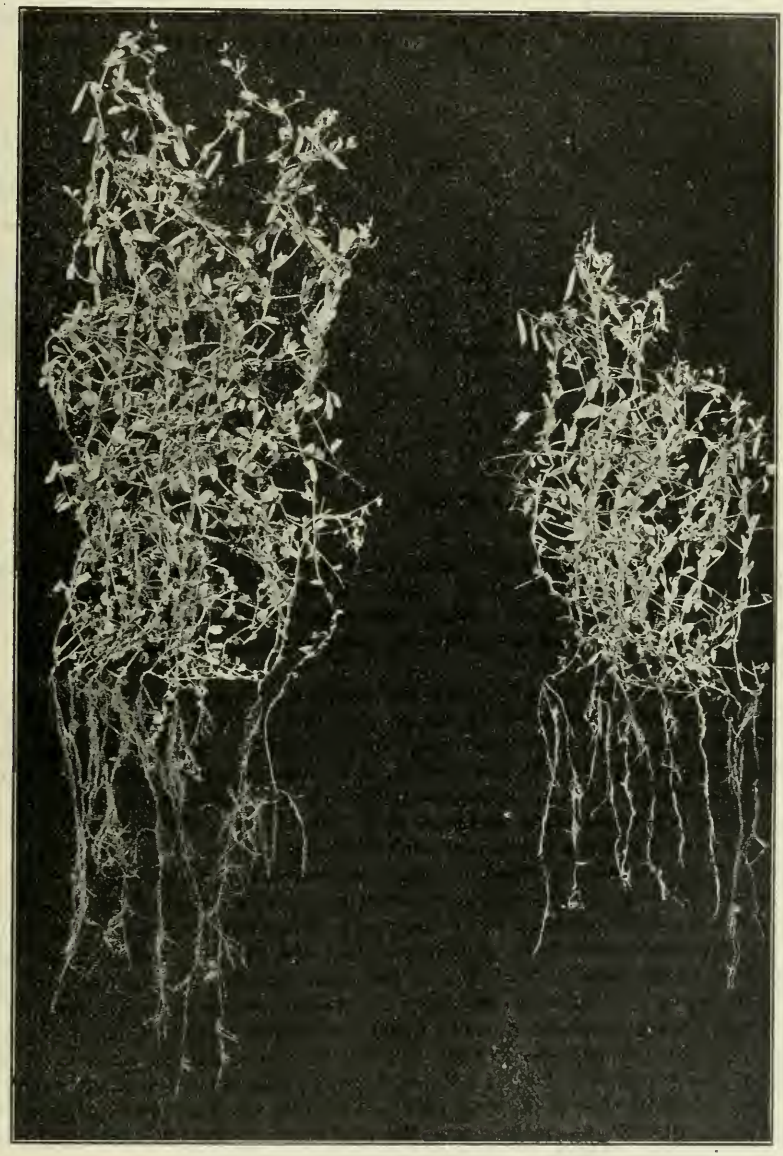
SUGAR BEET ANALYSIS.

Mr. Robert H. Lawder (now deceased) in a letter dated January 11th, 1899, wrote me to the effect that Mr. William James Stewart, Glasgow, Scotland, who represents a Scottish sugar syndicate, spent the winter of 1887-8 in the United States and Canada enquiring into the prospects for the profitable investment of capital in beet sugar factories. Further, that the above gentleman, having returned to Scotland, was at that time in correspondence with him (Mr. Lawder) in reference to Ontario as a suitable place for sugar factories.

Nothing more regarding this matter was heard until October last, when a communication from the Department of Agriculture, Toronto, requested me to make an analysis of beets which were then being forwarded from Aylmer, Ont.

A few days later, the above gentleman, Mr. William James Stewart, arrived at the Ontario Agricultural College to enquire into the results of the analysis of Aylmer sugar beets, and to arrange with us to have analyses made of other samples of sugar beets that would soon be forwarded from Aylmer, Dunnville and Wiarton.

In consultation with you, it was decided to comply with Mr. Stewart's request to analyse the beets, provided express charges were prepaid. In all, ninety-two samples of



(*b*) FIG. 9. (*a*)

sugar beets were received and analysed in our laboratory between October 25th and November 14th. Fifty-seven samples were received from Dunnville, twenty-two from Aylmer, and the remaining samples chiefly from Wiarton.

To obtain beets that yield profitable quantities of sugar, the roots must mature or ripen sufficiently before they are pulled. To grow such roots special attention must be

given to manuring, cultivation, thinning, etc. As a rule, the Canadian farmer manures, cultivates, etc., to obtain a big yield of roots, regardless of the proper degree of maturity for a high yield of sugar. It can be well understood that, owing to the influence of maturity upon sugar content, where little or no attention is given to the maturity of the beet, there would be grown good, bad and medium beets from a sugar standpoint. Such samples were received in our laboratory; consequently the averages cannot be so high as might reasonably be expected from proper and uniform cultivation.

In the following table averages are given of all samples pulled upon certain dates. These averages show better results, as a rule, in the samples of the later than in those of the earlier dates.

Place and lot.	Date of pulling.	Number of samples.	Average weight of roots.	Analysis of juice.		
				Solids.	Sugar.	Purity.
			lbs.			
Dunnville.						
First	Oct. 25th	1	1.35	16.34	12.8	79.2
Second	Nov. 1st	29	1.75	15.71	12.08	75.0
Third	Nov. 18th	8	1.71	18.25	14.50	78.4
Fourth	Nov. 22nd	10	1.35	18.60	15.03	80.8
Fifth	Nov. 27th	9	1.73	17.17	14.20	82.5
Aylmer.						
First	Oct. 24th	6	....	16.06	11.90	74.1
Second	Oct. 26th	5	1.80	16.54	12.44	74.8
Third	Nov. 14th	11	1.08	18.20	15.00	82.1
Wiarton.						
One lot	Oct. 30th	10	....	16.78	13.31	80.1

The above averages show that the November beets are better from a sugar standpoint than the October-pulled roots. Wiarton roots of October 30th are fairly good. The fourth lot of Dunnville beets were somewhat wilted when received. Mr. Stewart expressed himself quite satisfied with beets yielding 14 per cent. sugar in juice with purity 80.

It appears to me quite clear that there can be grown in Ontario sugar beets containing satisfactory quantities of sugar, and that several sections have soil, climate, and natural facilities suitable for sugar beet cultivation for factory purposes. However, it will be necessary, for the best results, to furnish growers with clear and full directions as to cultivation. It is my intention to publish such directions should there be a prospect of one or more beet sugar factories being established. This, however, does not appear to be the proper place and time for such a publication.

In concluding my report I would respectfully remind you of the vastly increased amount of work in my department occasioned by the method of teaching by laboratory work, *i.e.*, by the students of all the years performing experiments and doing laboratory work themselves as a basis of instruction. The value of this method is recognized and adopted by the best institutions. I have not found in any of the European institutions for the study of natural science that the staff of professors are so hampered and harassed through lack of demonstrators to assist in this practical method of teaching as we are in this College. In my last report, I asked for the appointment of a fellow in my department, but received none. At the opening of this present College year, seeing my situation, I engaged assistance, with your permission, upon my own responsibility rather than abandon what is known to be the best method of teaching natural science, hoping that the pressing necessity for a fellow would be recognized before long.

Work at Present Under Way.

It has always been difficult in this department, where results cannot be obtained rapidly, to complete investigations at a fixed or set time. There must necessarily be work under way, which, not being completed, cannot appear in the report.

We have at this date several important investigations that cannot be finished for this report. Of these, the most important are: (*a*) digestion work, to ascertain the relative composition and digestibility of nearly matured and freshly cut fodder corn, cut at the same time and cured, in the silo, in the barn, and in the field; (*b*) an investigation into the quantity and quality of gluten in different varieties of wheat, together with their bread-producing capabilities to see what extent the quantity and the quality of the gluten are related to the deteriorating strength noticeable in flour; and (*c*) the total ash constituents that the various staple crops remove from soil and the distribution of these several constituents in the grain and straw.

It will not be forgotten that each department in an institution of this kind has, at all times, a fairly heavy correspondence and numerous requests by farmers and others to analyize, examine, and identify samples and specimens of various kinds. This is a sort of work which, we know, must not be neglected nor delayed. My assistant, Mr. Harcourt, has this entire time more than occupied in the station laboratory with the analysis of miscellaneous substances received from farmers and others, and with a large part of the analyses belonging to the investigation work; while I find it quite impossible to handle alone, with any degree of justice to our students, our large classes, two of which, upon two days in the week, are present at the same time.

Finally permit me to express my appreciation of the valuable services rendered to this department by my assistant, Mr. Robert Harcourt, and to acknowledge the services of Mr. Wm. P. Gamble, who has cheerfully and gratuitously aided in what would otherwise have been an impossible task.

Respectfully submittted,

A. E. SHUTTLEWORTH,
Professor of Chemistry.

Ontario Agricultural College,
Guelph, December 30th, 1899.

PART VI.

PROFESSOR OF VETERINARY SCIENCE.

To the President of the Ontario Agricultural College:

SIR,—I beg herewith to submit my report for 1899.

CLASS-ROOM.

First Year—To the first year students I delivered a course of lectures on comparative anatomy, paying particular attention to the anatomy of the horse, and where important differences exist between the horse and the ox, drawing the attention of the class thereto. In this course, I aim at giving the students an intelligent idea of the general anatomy of domesticated animals, as regards bones, joints, ligaments, muscles, tendons, the digestive, respiratory, urinary, and genital systems; also the circulatory and absorbent systems, the skin, foot, and organs of special sense. I endeavor to make the points as simple and plain as possible, and use for illustration the skeleton of a horse, a living horse, specimens, and charts. I also gave a course of lectures called "Practical Stable", in which we discussed the proper kind of stables to build, in respect to site, size, material, ventilation, drainage, kinds and sizes of stalls, mangers, &c; the general care of horses, as regards food, water, work, grooming, care of feet, shoeing, &c., care of harness, saddles, &c., &c. Also a course of lectures on judging horses, in which I selected two or more individuals of the class of horses under discussion, mentioned the points as regards conformation, action and manners of a typical animal of the class, and then compared the animals present with the ideal. I impressed upon the class the general principles upon which a man acting as judge of horses should proceed in order to do justice to himself, the institution from which he graduated, the exhibitors, and the society for which he is acting.

To this class also I gave a course of lectures on veterinary *materia medica*, in which I spoke of the general actions of medicines, the properties, actions, uses and doses of the different drugs and remedies used for the prevention and cure of the ordinary diseases of farm stock.

Second Year.—To this class I delivered a course of lectures upon Veterinary diseases and treatment, mentioning the causes, symptoms and treatment of the ordinary diseases to which farm stock is subject, paying special attention to preventive measures. During the spring term I gave a course of lectures upon Veterinary Obstetrics, speaking of the general hygienic treatment of breeding animals, both before, during and after pregnancy; the means and precautions to be observed to prevent disease or accident and the symptoms and treatment of such as are liable to occur; the care of the young animal before and after weaning, &c., &c. I also gave a course of lectures and illustrations upon a subject we call "Practical Horse", in which I explained the desirable points of the different classes of horses, the means of detecting disease and blemishes in horses; the modes of securing horses for the performance of simple operations, such as dressing and stitching wounds, opening abscesses, dressing teeth, and bandaging; the different modes of administering medicines, with the precautions to be observed; dressing the feet, &c. In all my lectures to both classes my aim is to make everything as simple and practical as possible, avoiding technicality.

To the special dairy class I gave a short course of lectures upon the causes, prevention, symptoms and treatment of the ordinary diseases to which dairy stock is subject.

Besides class-room work, I gave professional attention to the farm, dairy and experimental stock; and while we have had considerable sickness, and some very severe cases, I am pleased to be able to state that the losses have been few. Below will be seen particulars of the diseases which occurred in the different kinds of stock during the year.

Horses.—We had a few cases of acute indigestion, colic, influenza, lymphangitis, sprains, &c., all of which yielded to treatment. We had one case of leuchorræ in a mare, which also yielded to treatment; and one of the experimental horses developed a ring-bone, which caused lameness. I fired with a hot iron and blistered, and the lameness disappeared.

Cattle.—We had three cases of parturient apoplexy (milk fever) in cows, all of which made perfect recoveries. We had one fatal case of pneumonia in a farm cow. The farm herd became affected with infectious ophthalmia, that serious and common disease of the eyes to which cattle have been subject for five or six years. We used the following mode of treatment with perfect success :—We isolated the affected animals as far as possible, protected them from the sun and wind, and excluded all draughts ; we also gave each animal a slight purgative, consisting of a pound of Epsom salts dissolved in warm water, and put a few drops of the following lotion into the eyes twice daily : Sulphate of zinc, 10 grs ; fluid extract of belladonna, 15 drops, and water, 2 oz. In a few cases an ulcer formed and burst, in which cases I touched the parts carefully, once daily for a few days, with a pencil of nitrate of silver. In every case a thorough recovery resulted. We had several cases of inflammation of the udder, sore teats, impaction of the rumen, retention of the placenta, fardel-bound, a few cases of lameness, &c., all of which recovered. I dehorned several feeding steers, and both Mr. Rennie and Prof. Day have arrived at the conclusion that they are more gentle and feed better after the operation.

PRACTICAL HORSE—VETERINARY DEP'T.

Sheep.—We had three fatal cases of grub in the head. One ewe died during parturition. A ram got his leg fractured and as he was in good flesh we decided that it would be more profitable to butcher than to treat him. We lost two or three lambs from wool ball in the fourth stomach. The lambs became affected with tape-worm, as usual, and we treated them as follows : We made a mixture of one part oil of turpentine and sixteen parts sweet milk, starved the lambs for 10 or twelve hours and administered to each from 2 to 4 oz. of the mixture, according to age and size, and after ten days we repeated dose. We had no actual losses, but the lambs did not do so well as they otherwise would have done. A few of the ewes were worried by dogs, and as a result one of them died,

Swine.—We had very little trouble with the swine and no fatalities, except in newly born pigs.

I have, Sir, the honor to be,
Your obedient servant,

J. H. REED.
Professor of Veterinary Science.

Ontario Agricultural College,
Guelph, Dec., 19th, 1899.

PART VII.

PROFESSOR OF DAIRY HUSBANDRY.

To the President of the Ontario Agricultural College:

DEAR SIR,—I beg leave to submit my ninth annual report of the Dairy department. I wish to acknowledge assistance given by the Farm, Chemical and Bacteriological departments during the year. Mr. Rogers, instructor and experimenter in the butter section of the department, resigned on May 1st. Miss Bella Miller and Miss Alice Squirrell, graduates of the Dairy School, were placed in charge during the summer, and did the work in a very satisfactory manner. Mr. Stratton has done excellent work in the cheese section. He has also acted as butter instructor for the regular college students and for the special creamery course in the month of December.

Mr. Jas. A. McFeeters, graduate of the dairy class of 1897, has been appointed to succeed Mr. Rogers as experimenter and instructor in the butter section.

THE DAIRY SCHOOL.

The past year has been a very successful one for the Dairy School. In addition to the regular course during the months of Jannary, February and March, we have had a special creamery course in December of this year. The attendance at the regular course exceeded that of 1898, during which year there were 110 registered. In 1899, the number of students registered during the three months was 115, of whom 17 were ladies. During the creamery course in December the attendance was nineteen, including four ladies; also about 40 second year students in the regular course took this course.

Of those who attended in the early part of the year 53 registered for the full course, including cheese-making, separators, milk-testing and butter-making; 17 took special work in butter-making and milk-testing; 3 took butter-making alone; 7, cheese-making and milk-testing; 1, cheese-making; 4, milk-testing; 3, special work on general lines; and 27 took the home dairy course. It will thus be seen that our students choose quite a variety of dairy work. This, to a certain extent, hinders the work of our regular classes; hence, one reason for a special course in butter-making during December. It may also be necessary to have special classes for cheese-makers and home dairy men and women in December, to lessen the number who at times crowd the work in practical cheese and butter making during the regular term. We would prefer having for the three months' term only those who purpose taking up the full course, and would also prefer that these should all have more or less experience before coming. Inexperienced students, those staying for a short time only, and those who wish to take up work in only one department, can be best managed in small classes during a special term.

Of those registered for butter-making only, their experience ranged from 0 to 21 years. The cheese men's experience was 0 to 16 years. It is difficult to map out work suitable for such, at one and the same time.

We had considerable difficulty in securing a supply of milk suitable for our work. As Guelph and the vicinity is not a dairy section, we shall, I presume, always meet this difficulty.

On the final examinations at the close of the term 44 wrote for certificates, of whom 5 were specialists in butter-making, 2 in cheese-making, and 2 in home dairy work. All passed, but certificates were with held from a number owing to lack of experience.

It is gratifying to know that a number each year send in the monthly reports for professional diplomas. Those applying this year are: J. W. Newman, Roebuck, Ont. (cheese); John McCready, West Lima, Wis. (cheese); T. B. Code, North Rideau, Ont (cheese); Harvey Mitchell, Sussex, N. B. (butter); S. J. Taylor, Regina, N. W. T (butter).

Most of our students came from the Province of Ontario. There was one student each from the following Provinces, States, and countries: Quebec, Manitoba, British

Columbia, Pennsylvania, U.S.A., Scotland and England. We had demand for more students as makers and helpers last spring than we could supply. So far as we know, all who were capable of working in creameries or cheese factories secured places at the close of the term or shortly after.

To the Instructors in the Dairy School and the Lecturers from the College, I am indebted for their efficient work during the term.

Care of Milk for Cheese-making.

There is a diversity of *opinion* as to the best methods of caring for milk to be manufactured into cheese, and but few *accurate experiments* have been made to discover what is really the best plan. During July, August and September, some 40 experiments were made by treating the milk from our own herd in different ways in order to gain some definite knowledge on the subject. Most cheese makers advocate aeration of the milk, and say that if the milk is properly aired, it will not require cooling. Others recommend airing and cooling, while the average patron thinks that nothing is necessary. We have found it a very complicated problem and one which will require several year's investigation in order to ascertain the effects which the cows themselves have on the milk, the effect of pasture, the effects of weather, methods of handling, etc. At present, I am inclined to think that the peculiar condition of the atmosphere at times is largely responsible for "gassy" and other flavors, assuming that cleanliness is observed. Under certain conditions the milk from our own cows is "gassy," no matter how it is handled; and this is probably true of many, if not all herds of milk cows. At certain times the growth of bad-flavored organisms is very rapid and it is difficult, with our present knowledge, to prevent them growing. Here is a field for the Dairy Bacteriologist to work in, and find out how the bad crop of germs may be best controlled.

Our experiments during the past season may be classified as follows: 1. Effect of aeration of milk at the stable, in the cow yard, and in the pasture field; 2. Effect of aeration combined with cooling by means of ice; 3. Effect of cooling without aerating; 4. Effect of milking in the stable, yard, and the pasture field; 5. Effect of rejecting the first few streams of milk from each teat; 6. Effect of aerating milk one day and not aerating the next; 7. Care of Saturday night's milk.

We shall treat them under two general headings: Effect on sweetness of milk, and on quality of curd and cheese.

At the time of the experiments, we were milking about 25 cows. Some were fresh and others were in various stages of lactation. Our herd consists of a mixed lot—some pure-bred Holsteins, Jerseys, and Ayrshires, and the remainder, grades of various breeding.

The Champion aerator was used in most of the work. A few trials were made of the Cornett aerator and agitator. The aerated lots were usually run over the aerator twice. The temperature of the air at night varied from 59° to 86°. The temperature of the air in the morning varied from 42° to 70°. The temperature of the milk at night was 90° to 96° before aerating, and 84° to 94° after aerating. The night's milk which had been aerated was 54° to 73° the following morning. The unaerated night's milk was 55° to 74° the following morning. The rennet test of the aerated milk was 21 to 29 seconds, and that of the unaerated 12 to 26 seconds the following morning. The quality of milk in each lot varied from 109 to 120 lbs. in one can. When the temperature of the air at night was 80° or above, the milk which was aerated twice over the Champion without any cooling other than that done by the atmosphere, was very ripe, or sour, the following morning. The same was true of the Cornett aerator.

When the temperature of the night air was under 80° and that of the morning air under 70°, the milk was in good condition the following morning, by aerating only. When 4 to 6 lbs. of ice were placed in a shot-gun can and the can set in the milk after aeration, or in the unaerated milk in hot weather, the milk was sweet the following morning. On Aug. 28, when the temperature of the evening air in the milk stand was 84°, and the temperature of the morning air 60°, and that of the milk 95° in the evening and 68° in the morning, a can of milk containing 152 lbs. was set in a tub of cold water and the Cornett agitator set going. The following morning the rennet test of the milk 8 seconds, or, in other words, it was nearly sour. Ten pounds of ice were put in the

water the following evening, and the rennet test was 20 seconds, which means that it was sweet.

To sum up the whole question of aerating and cooling in their effects on the ripeness of milk, these experiments indicate that aeration alone is not sufficient to keep milk sweet over night and in good condition for cheesemaking the following morning during hot weather, or when the air is above 80° at night, or not below 70° in the morning; but a very small amount of ice placed in a can and the can set into the milk will keep it all right. This is necessary only on hot nights.

For keeping the milk sweet, 4 to 6 lbs. of ice in a can, set in the milk, was more effective than aeration.

Flavor and Gas in Curd as Affected by Place of Milking and Place of Aeration.

On July 19th, the cows were milked in the yard, stable, and pasture field, and half the milk was also aerated in the yard, stable, etc., and the other half not aerated at all. Possibly the best plan to show the effects will be to give the treatment of the milk each day and the comments of our cheesemaker, Mr. Stratton.

July 19th. Cows milked in yard. High wind blowing the dust about very badly. Milk in A vat was aerated in yard; in B vat, not aerated. Both curds had an equal amount of gas. B curd had also a weedy flavor. A cheese scored 90 points, B 93, on Aug, 30th.

July 20th. Cows milked in yard. Wind did not blow. A vat aerated in yard; B not aerated. Acid slow in A. B vat very gassy. A cheese scored 88, and B 87, on Aug. 30th.

July 21st. Cows milked in yard. A vat of milk aerated in yard; B not aerated. Curds in both seemed good until heated; then they developed a very bad flavor. Cheese scored 91 and 92 on Aug. 30th. Both scored 84 points on Sept. 19th.

July 22nd. Cows all milked in pasture field, half mile from dairy buildings. Milk in A vat aerated in pasture field; B vat not aerated. A was a nice curd; B had very little gas, but a very bad flavor. B vat, washed twice at dipping time. Score of cheese on Aug. 30th—A, 93; B, 88 points. Flavor, 37 and 36 out of 40.

July 25th. Cows milked in stable. Milk all run over Champion aerator once in stable and once at dairy. Milk not divided. Curd very gassy. Cheese scored 85 points on Aug. 30th.

July 26th. Cows milked in stable, but milk carried outside and aerated once in yard. Aerated again at dairy. Rained previous day. No dust blowing. Gassy at milking time, but nice when salted. Cheese scored 93 points.

July 27th. Cows milked in stable. First six streams from each teat put into separate pails. Weight of rejected milk in evening, 12½ lbs., testing 1.5 per cent. fat. Morning milk rejected, tested 1.3 per cent. fat, and weighed 15 lbs. Milk very ripe. Curd washed with cold water after being heated to 108° before dipping. Score of cheese, 65 points.

July 28th. A vat from dairy herd. Cows milked in yard and milk aerated in yard and once at dairy. B vat of milk from patrons' regular delivery and not aerated. Both curds gassy. No starter used. Cheese scored 90 and 91 points. Both scored 36 in flavor.

July 29th. Cows milked and milk aerated in pasture field. Milk over-ripe. Curd washed with cold water after heating to 106°. After milling, curd had a "slimy" feeling and flavor not good.

Aug. 1st. Cows milked in stable and milk aerated at stable and once at the dairy. Starter used in milk. Curd slightly gassy, but after milling the gas and gassy flavor disappeared. Score of cheese, 89, on Sept. 19th.

Aug. 2nd. Cows milked in stable, but milk was aerated in yard once as milked and once at dairy after milking. Starter used. Curd gassy. Score, 89.

Aug. 3rd. Cows milked in stable, but first few streams from each teat put in a separate pail. The night's and morning's rejected milk weighed 30 lbs. and tested 1.5 and 1.3 per cent. fat. One-half a per cent. of starter used. Curd very gassy. Score of

cheese on Sept. 19th was 90 points. Messrs. Bell, Brill and Steinhoff each scored this cheese on Nov. 17th, and gave it respectively 89, 92 and 94 points.

Aug. 4th. Cows milked in yard. Milk aerated once in yard and once at the dairy. One-half a per cent, of starter used. Curd worked nicely. Best flavor and least gas of any day during the week. Score, 91 points.

Aug. 5th. Cows milked in pasture field and milk aerated in pasture field. Starter used. Curd gassy. Flavor fair. Score, 88, on Sept. 19th.

Aug, 8th. Cows milked in stable. Milk not aerated. Flavor of curd very bad. No starter. Little gas. Curd weak in body. Score, 91, on Sept. 19th.

Aug. 9th. Milk run over Champion aerator twice. No starter. Milk sweet and ripened slowly. Bad flavor at dipping time, which disappeared at salting. Curd gassy. Score of cheese, 87.

Aug. 11th. Milk aerated twice. No starter. Curd worked nicely. Some bad flavor at dipping time. Good curd at salting. Score, 90, on Sept. 19th, and it was given 83, 87 and 85 by the judges on Nov. 17th.

Aug. 12th. Mllk not aerated. Milk over-ripe. Washed curd after dipping. Flavor fair. Score, 78.

These experiments were continued up to Sept. 29th. Sometimes half the milk from the dairy herd was aerated and the other half was not aerated in any way. At other times all the milk from the herd was aerated one day and left unaerated the next. There was very little difference in the curds or in the quality of the cheese, as shown by the average score of the cheese in the table. Where the milk was mixed together before aerating, and while the milk was warm, the cheese have an average total score of exactly the same, though the cheese made from the aerated milk was slightly better in flavor. Where the milk was not mixed together, but all the milk aerated one day and left unaerated the next, the average score of flavor is slightly better in the unaerated cheese, and the total score is also higher.

Average score of cheese from aerated and unaerated milk.

—	—	Average lbs. milk used.	Average per cent. fat in milk.	Average lbs. cheese per 1,000 lbs. milk.	Average flavor. (Max. 40.)	Average closeness. (Max. 15.)	Average texture. (Max. 20.)	Average total. (Max. 100.)
Milk mixed together before aerating half of it...	Aerated...	290	3.55	94.04	36.04	13.09	17.14	90.04
	Unaerated	287	3.55	93.19	35.45	13.36	17.23	90.04
Milk not mixed together..	Aerated...	.....	....	.....	34.18	13.07	16.78	88.11
	Unaerated	.....	.....	.....	36.13	13.33	17.13	90.93

Conclusions.

1. Milking and ærating in the pasture field gave two very good curds and one bad curd, chiefly due to milk being over-ripe.

2. On certain days the curds were gassy, no matter where the cows were milked or how the milk was treated. A good flavored starter in the milk seems to be the best remedy for gassy and other bad flavors.

3. Rejecting the first few streams of milk from the teats of each cow did not prevent gas forming in the curd.

4. In these experiments aeration of the milk did not prove so beneficial as we expected. When the cows are healthy and are fed on clean food and are milked in a cleanly manner, in a clean place, aeration is probably of no particular advantage to milk for cheesemaking. Aeration to some extent cools milk and is thus advantageous in keeping it sweet.

5. Further experiments are needed before coming to definite conclusions.

Saturday Night's Milk.

In many cheese sections it is customary to make the milk of Saturday evening into butter or cheese during Saturday night and Sunday forenoon. This makes a slave of the cheesemaker who has practically no rest during the week.

During July and August some experiments were made to find to what temperature it was necessary to cool the milk on Saturday evening in order to have it in good condition on Monday morning.

The milk from the dairy herd was divided into two lots, and put into cans which were placed in cold water. The temperature to which the milk was cooled ranged from 46° to 64°. It will be noticed in the table that when the air in the milk-stand was 72° to 82° and the milk cooled to 62° to 64° the milk was nearly sour on Monday morning, and would in all probability be rejected at a cheese factory. A can of similar milk kept in the same place but cooled to 52° to 54° was in good condition on Monday. When the temperature of the air in the milk-house is between 70° and 85° it is necessary to cool to between 50° and 55° for good results. When the temperature of the air is between 65° and 75°, cooling the milk to 56° to 58° gave good results. During the summer it is seldom safe to hold milk until Monday at a temperature above 58° to 60°, and in hot weather it should be cooled to 50° to 55°. In these trials the milk was not aerated any more than the necessary aerating which it received by stirring it with a dipper while cooling.

On August 12th one lot of 95 lbs. was put into a can and a lot of similar milk was divided among four shot-gun cans to see the effect of keeping milk in a smaller bulk. There was no difference in the sweetness or general condition of the two lots of milk.

Saturday night's milk set in tank of ice water and stirred with dipper.

Date.	Pounds milk in each can.	Temp. of air. Min. and max.	Temp. of milk. (Range.)	Rennet test on Monday morning. Seconds.	Remarks.
July 15.....	110	72° to 82°	62° to 64° 52° to 54°	9 25	Milk would be rejected at a factory. Good condition.
" 22.....	95	67° to 73°	56° to 58° 46° to 48°	25 35	" " " "
" 29.....	98	52° to 70°	56° to 58° 46° to 48°	26 37	" " " "
Aug. 5.....	96	56° to 73°	58° to 60° 50° to 52°	24 30	" " " "
" 12.....	95	52° to 70°	54° to 56° 54° to 56°	31 31	One lot was divided into 3 shot-gun cans. No difference in rennet test.

Careful *vs.* Rough Handling of the Curd.

On July 7th and 8th 1200 pounds of milk were thoroughly mixed in a vat each day. Six hundred pounds were then weighed into another vat and both treated exactly alike except that one vat of curd was handled very roughly at cutting, and during the heating process the other vat was handled as carefully as possible to see the effects upon yields of cheese and texture of the cheese. The 600 pounds of milk handled carefully yielded about one pound of cheese extra, as compared with 600 pounds of similar milk handled carelessly. There was not much difference in the quality of the cheese. The texture was practically the same in both lots.

On July 10th 1200 pounds of milk as delivered by the patrons were placed into one

vat, and 1200 pounds put into another vat. The treatment was the same as on the 7th and 8th, except that the milk was not previously mixed together. Again there was an increased yield of cheese from that which was carefully handled, but the difference in quality was very little.

The lesson to be learned is that cheesemakers should handle the curd very carefully at the cutting and also during the heating of the curd, or there will be a loss of cheese. On a vat containing 6,000 pounds of milk the loss may be as much as 10 pounds of cheese. This loss will nearly equal the extra wages of a first-class maker over what is paid to an inferior man that is careless in his work.

Curing Cheese at Different Temperatures.

These experiments were conducted on much the same lines as those of last year. The College curing-room is divided into three compartments which were kept on an average temperature of about 60°, 65° and 70° respectively.

The cheese made in the College dairy each day from May to October were always from the same vat of milk and when taken from the press were carefully weighed and marked A. B. and C. They were then placed in the different rooms at the temperatures given. These cheese were weighed at the end of a month and the per cent. of shrinkage noted. The cheese were scored at different times by experts. Two lots were sent to Stratford for scoring by Thos. Ballantyne & Sons, and by Mr. I. W. Steinhoff. Messrs. A. T. Bell, I. W. Steinhoff and G. J. Brill scored the September and October cheese on Nov. 17th. each scoring separately, and where there was much difference in the scores, the three judges together scored them a fourth time.

Green cheese were also obtained from the Freelton factory during the five months from June to October, and from the Rockwood factory during four months, June to September. One lot of three cheese were got from each factory every month. These were carefully weighed, marked and placed in the curing-rooms along with the College cheese.

The main points of the experiments are summarized in the tables.

Four experiments, factory at Rockwood.	A.	B.	C.
Size of room, cubic feet	863.	1,844.	863.
Method of controlling the temperature	Ice.	Sub-earth duct.	No control.
Method of controlling moisture	"	"	"
Highest temperature in room	67.°	72.°	80.°
Lowest "	52.°	58.°	56.°
Average "	59.4°	64.8°	68.3°
Highest per cent. moisture in room	90.	90.	90.
Lowest "	67.	53.	50.
Average "	80.0	79.0	72.6
Average per cent. shrinkage in cheese in one month	2.71	2.78	3.26
Quality of cheese: Average flavor Max. 40	32.11	30.0	29.22
" closeness " 15	13.88	13.66	13.67
" color " 15	14.11	13.78	14.00
" texture " 20	17.78	16.89	16.55
" total score " 100	87.88	84.33	83.44
Five experiments, factory at Freelton.			
Average per cent. shrinkage in cheese in one month	2.10	2.23	2.78
Quality of cheese: Average flavor Max. 40	35.58	33.25	33.83
" closeness " 15	14.46	14.00	13.75
" color " 15	13.83	13.75	13.50
" texture " 20	17.17	16.58	15.50
" total score " 100	91.04	87.58	86.58

Summary of cheese-curing experiments, six months, May to October. Cheese made

in College dairy. The highest outside temperature was 98 degrees, the lowest 18 degrees, and the average 59 degrees.

Total number of experiments, 54.		A.	B.	C.
Size of room, cubic feet		863.	1,844.	863.
Method of controlling temperature		Ice.	Sub-earth duct.	No control.
Method of controlling moisture		"	"	"
Highest temperature in room		67.°	72.°	80.°
Lowest "		52.°	58.°	56.°
Average "		59.4°	64.8°	68.3°
Highest per cent. moisture in room		90.	90.	90.
Lowest "		67.	53.	50.
Average "		80.0	79.0	72.6
Average per cent. shrinkage in cheese in one month		4.40	4.54	4.89
Quality of cheese	Average flavor Max. 40	36.01	35.46	35.51
	" closeness " 15	13.62	13.27	13.15
	" color " 15	14.23	14.21	14.12
	" texture " 20	18.15	17.69	17.53
	" total score " 100	92.01	90.63	90.31

Conclusions.

1. The shrinkage, or loss in weight, during the curing for one month was about one half of one per cent. greater curing at 70° as compared with curing at 60°. A factory making half a ton of cheese per day would lose five pounds more per day in the curing at 70°, as compared with curing at 60°. Five pounds of cheese would mean a loss of about 50 cents per day during the past season. For 200 days the difference in loss would be about $100 on shrinkage alone.

2. The cheese cured at a temperature of about 60° were also better in quality, though there is not the same marked difference as there was last year. This is accounted for by the fact that the nights were much cooler this past season, and the strong demand for cheese inclined the judges to look with more favor on the cheese which were cured most at the time of scoring. This was especially noticeable in the lots sent to Stratford.

There was the same difference in quality of the cheese made in the two factories where the weights of the cheese were 75 to 80 lbs. as there was in the College cheese weighing about 30 lbs., or even more so, especially in flavor. It was more pronounced in the Rockwood cheese, which apparently had more moisture. It will be noticed in the table that the difference in flavor of the College cheese was only about half a point as the average of the season, while the difference in flavor of the Rockwood cheese was about three points, and in Freelton cheese two points. The difference in texture also is not so marked as it was last year, there being but half a point in the College cheese, one point in the Rockwood, and one and a half points in the Freelton cheese by curing at 60° and 70° respectively.

Curing Cheese at High Temperature for a Week, then Placing in Medium and in Cool Rooms.

From May 15th to July 15th five cheese were made from one vat of milk on eleven different dates. These cheese weighed about 30 lbs. each. Three of them were placed in the room averaging about 70° as soon as taken from the hoops. At the end of a week one of these three was placed in the cool room, averaging about 60°, and another was placed in the medium room, averaging about 65°, while the third was allowed to remain in the warm temperature. One each of the remaining five cheese were placed in the cool and medium temperatures at once after taking them from the hoops. The object of these experiments was to note the effects on shrinkage and quality of cheese from placing the green cheese for a while in a warm room to start the curing or ripening and then finish the process in a cool and medium temperature.

The average shrinkage of the cheese placed in the cool room and allowed to ripen there was 4.31. Those placed in a medium temperature lost 4.73 per cent., and those cured at 70° lost an average of 5.05 per cent. The cheese placed in the warm room and then moved to a cool room lost 4.25 per cent. in weight during the four weeks, and the lot moved from the warm room to a medium temperature lot 4.62 per cent. in four weeks, one week of which was in the warm room.

The conclusion may be drawn that the loss of weight during the curing is almost directly affected by the temperature of the curing-room. The higher the temperature the greater the loss of weight while ripening. Other factors no doubt affect this loss, but temperature seems to be a very important one.

Quality of the Cheese Cured at Five Temperatures.

Av. Temperature for Curing.	Av. Flavor. Max. 40.	Av. Closeness. Max. 15.	Av. Color. Max. 15.	Av. Texture. Max. 20.	Av. Total. Max. 100.
60°	36.71	13.75	14.06	18.33	92.85
65°	36.29	13.47	14.12	17.97	91.85
69°	35.87	13.27	14.12	17.69	90.97
69° one week then 60°	36.24	13.52	14.13	18.02	91.92
69° one week then 65°	36.35	13.61	14.06	18.15	92.17
Average of all.	36.29	13.52	14.09	18.03	91.95

Conclusions.—It will be seen by the foregoing table that there was little difference in the quality of the cheese cured at these different temperatures. What difference there is in quality is in favor of curing at about 60°. Curing at 69° for a week and then curing at 60° for the remainder of the time gave practically the same results as curing at 65° for the whole period, and slightly better results than curing at 69° for the full term. Curing at 69° for a week, then finishing at 65°, gave the next best results to curing at 60°. Taking the results as a whole there was not the difference in quality we might expect, judging from the results of experiments in 1898; but there is apparently no advantage in curing at a high temperature for a week, as advocated by some authorities. However, another year's experiments may give different results.

A Bad Flavor in Cheese.

In the Middlesex and Elgin districts this past season the makers were greatly troubled with a bad flavor in the curd and cheese. In these sections it is locally termed "the Billy Goat flavor." It was also troublesome more or less in other western sections, where it is sometimes called a "Goose flavor." Mr. Stratton found that it is also giving some difficulty in the eastern factories. One of the worst cases was at Avon, in Elgin county. A peculiarity of the flavor is that it can seldom be detected in the milk, although Mr. Scott, of Harrietsville, says he detected it one morning in the milk, and the flavor was present on the curd and in the cheese. The milk appears to work normal, or at times a little "fast," and the flavor does not appear to develop until the acid shows on the curd, as tested by the hot iron. I brought a sample of two cheese from the Avon factory and submitted them to the College bacteriologist. He made cultures from them, and we made cheese from some of the cultures, but there was no "Billy Goat flavor" about the cultures or the cheese.

Later the maker sent down some curd that had the "flavor," and a culture from this gave the undesirable aroma in the curd and in the cheese. This curd was from the only batch in the Avon factory having this flavor from August 1st to August 10th. Another peculiarity about the flavor is that it does not appear every day but may skip several days, and when the maker thinks that his troubles are past it reappears in one or more vats. Sometimes it may be in one vat only, sometimes in two, or in several.

The cheese made from a culture of this bad-flavored curd had all the characteristics of the "B. G." flavor for two or three weeks. It gradually disappeared, however, until, when scored on Nov. 17th, it could not be detected, and the cheese was very fair in quality.

Mr. Archie Smith, one of the instructors for the Western Cheese and Butter Association, gives the following as his method of treating the curd to overcome the difficulty: "Heat the milk to 84° in the vat and set, using not less than 3½ ounces of rennet per 1,000 lbs. milk. If the milk is working fast enough to allow the curd to dip in 2¾ to 3 hours I would heat up to 88° or 99° at once; but if the milk is working slowly, I should heat to but 94° to 96° and stir it continually until the acid begins to show on the hot iron. Then heat quickly to 99° or 100° and run the whey to the surface of the curd. Stir the curd well until it shows nearly an eighth of an inch of acid; then dip. The curd will be quite soft and I do not attempt to firm it at this stage, but merely turn it over three or four times quickly, so as not to allow it to mat together, being careful to bruise it as little as possible. Leave it spread over the curd sink three or four inches deep, then cut it in small narrow strips and do not pile it. By this method the curd will drain well, and there will be no loss of butter or white whey. The acid will develop very quickly, and when it shows 1 to 1¼ inches on the hot iron I would mill immediately. After milling wash it thoroughly with clean water at a temperature of 94° to 96°. This will wash out the sour whey, firm the curd and help the flavor. Keep the curd well spread over the sink, stir frequently, and do not allow it to mat. Air it as much as possible and keep up the temperature until just before salting. Cool to 80°, if you can do so, before putting to press. Use one-quarter of a pound more salt per 1,000 milk than with an ordinary curd."

Methods of Controlling Temperature in Cheese-curing Rooms During Hot Weather.

A great deal of interest has been aroused among cheese-makers and factory owners in the question of curing cheese at a moderate temperature in hot weather. Owing to the cool nights of the past season, and the great demand for cheese, the full benefits of the various systems advocated and used were not ascertained. It is in a hot season, with hot nights and a slow demand for cheese, that the value of sub-earth ducts, ice-boxes, air compressors, pans, etc., are demonstrated.

In connection with this question I visited the following factories in Western Ontario in April and May and gave help in the construction of ducts: Woodburn, Canboro' and Lyons. I also visited Nilestown, Dorchester, Harrietsville, Mapleton, and Glanworth factories about the same time. In July and August I visited Norwich Junction, Dunboyne, Malahide, Northwood, Lyons (2nd visit), Springfield, Brownsville, Culloden, Avon, Harrietsville (2nd visit), Strathallan, Tavistock, Woodburn, (2nd visit) Caistorville, (2nd visit), Canboro and Caledonia.

There are ducts in the following: Woodburn, Canboro', Caistorville, Caledonia, Lyons, and Dunboyne. At Springfield, Harrietsville, Strathallan, and Tavistock there were ice-boxes in the curing-rooms, but at Strathallan only did I find any ice in the boxes, though the rooms ranged from 70° to 73°. The temperature in the curing-room at Strathallan was 70° at about 5 feet from the floor, but the air at the bottom of the box was 60°, while in the shade outside it was 78° at the time of my visit on August 2nd. So far as I could gather from those who had the ice-boxes, they could prevent the temperature from going above 70° by a liberal use of ice, but the labor of getting in the ice is quite a serious drawback in factories where the help is limited.

At Nilestown there is a single row of iron pipe about the curing-room into which spring water may be turned when needed for cooling. This is a cheap and effective method where cold water is convenient.

Construction and Cost of Sub-earth Ducts.

Last year I described in detail the construction of the duct to the College curing-room. The following are some of the main points in the ducts which have been put in during the past season:

The first factory that I visited to give help in placing a sub-earth duct was that of Mr. J. N. Paget, Canboro', in Haldimand County. I assisted with the laying of the tile in April and again visited the factory in August. The soil is a heavy clay and gave considerable trouble by cav ng into the trench. This duct averages seven feet in depth and has four rows of 5-inch drain tile in the bottom of the trench, with one row of 5-inch and

two rows of 4-inch lying directly on top. A circular brick curb at the farther end of the duct forms the inlet for the air to the tile. It was Mr. Paget's belief that a tall pipe would not be necessary on top of the brick curb, but he found that the draft was not good, so he had a conical-shaped, wooden inlet made, with a cowl on top, made of galvanized iron. The wooden part is three feet square at the base and 20 inches at the top, made of 2x4 scantling and covered outside with half-inch lumber. The height is 31 feet, but the factory is located on the high bank of a creek, with no high buildings near to hinder the draft. The drain for water that might accumulate in the duct was placed at the factory end, because most convenient, though I would prefer it at the other end. The whole length of the duct is 150 feet, and cost $80.

I took the following observationson August 11th: Velocity of the wind outside, 250 to 500 ft. per minute. Velocity of air entering the curing room through the duct, 80 to 110 ft. per minute. Temperature outside in shade at 3 p.m., 78°; in the sun at side of curing-room 92°. Temperature in the duct 62°; in the room 72°. This curing-room is not well insulated, and it very seldom went above 72° during the summer. Mr. Paget is well pleased with the duct, and proposes to insulate the room thoroughly for the coming season, when the results will be better. (Since this was written have heard that factory was burned to the ground).

The second factory visited was Woodburn, in Wentworth County, owned by Mr. A. J. Edwards. I assisted in the laying of the tile in April and again called at the factory on August 10th. This duct is 152 feet long and averages seven feet deep. There are three rows of 6-inch drain tile in the bottom of the trench, and three other rows placed directly on top, though the joints were broken. The drain for carrying off water is about the centre of the duct. The inlet pipe was built 38 feet high at first, but the draft was very poor, owing to the fact that there are a number of tall elm trees near the factory and buildings on the side of the prevailing winds. He was compelled to add several feet to the intake pipe, and it is now 62 feet high with cowl on top, the whole made of galvanized iron, 15 inches in diameter. Before the intake pipe was heightened, Mr. Edwards tried lengthening the outlet pipe from the curing-room, but this was not satisfactory. The curing-room is well lined and has double windows and doors. On August 10th the velocity of the wind outside was 115 to 150 ft. per minute at 8 a.m. Inside, the air was entering at the rate of 50 to 75 feet per minute, though at times the draft was not suffi- to move the anemometer. The total cost of the duct was $65, exclusive of Mr. Edwards' own labor. He did most of the excavating and the carpenter work. He was pleased with the results after getting the inlet pipe of sufficient height.

The proprietor of the Caistorville factory is Mr. A. W. Edwards, a brother of Mr. A. J. Edwards He was at Woodburn at the time of my first call. He put a duct into his factory without any further assistance. The factory is on the bank of the Chippewa Creek, and Mr. Morrison, instructor for the Cheese and Butter Association, reported this duct during the summer as giving excellent satisfaction. The duct is 115 feet long and 8 feet deep. The tile consists of 3 rows of 5-inch, 2 rows of 6-inch and one row of 8-inch. The intake pipe is made of galvanized iron and is 30 feet high. The inlet to room is simply a hole cut in the floor, and the outlet is into a room above with no direct connection outside. The factory and curing-room are poorly constructed and the loss of "grease" was very great in former years.

In the forenoon of August 10th there was little or no draft into the room, though there was a very faint breeze outside. After dinner the wind outside was moving 115 to 270 feet per minute, and inside it was 70 to 155 feet per minute. The temperature outside in the shade was 78°, inside 68°, and in the duct 64°. In the early part of the season a stream of water flowed under the tile in the duct, and this, no doubt, helped considerably to cool the air, On August 10th the stream had practically dried up. The total cost of this duct was $65, exclusive of Mr. Edwards' own labor.

If the curing room were properly insulated this duct would give excellent service, although, as it is, the proprietor is well satisfied with his expenditure.

In the same district is the Caledonia factory, Haldimand County. The owner, Mr. J. M. Clysdale, built a duct 153 feet long and 6 feet deep. He used 7 rows of 5-inch tile, 4 in the bottom and 3 rows directly on top. This duct did not work so well as the others, owing to the fact that the inlet pipe is but 30 feet high and is located in a hollow, surrounded by trees. The pipe was made of boards put together lengthwise. He pur-

poses adding 15 or 20 feet to the pipe next season. The duct cost about $100. On Aug. 11th the temperature in the room at 8 a.m. was 70°, though it was but 68° in the shade outside. The air was very still, not enough to move the anemometer at times, though occasionally it reached 110 ft. per minute. There was no perceptible draft into the room. The curing room is a very large one, and the owner proposes to put a partition through it before another year.

The owner of the Lyons factory in Elgin Co. is Mr. J. H. Williams, an ex-student of the Dairy School. His duct is 168 feet long, and 6 to 8 feet deep. He used two rows of 10-inch tile. The intake pipe is made of inch boards put together lengthwise, with white lead and twine along the edges to make a tight joint. The pipe is 50 feet high with a galvanized iron cowl on top, the mouth of which is about 3½ feet in diameter. The pipe sits over a well, but is not connected with it any more than the opening on top. The tile of the duct also opens into this well. For leading the air from the duct into the curing-room Mr. Williams used tile with elbows to connect the main drain with the rooms, thus doing away with the need of curbs. This is the only place I have seen drain tile with the elbow for making a turn.

The velocity of the air outside on August 14th at 9 a.m. was 200 to 300 feet per minute. Coming into the room the air travelled 70 to 100 feet per minute. Temperature outside in shade was 70°, in the curing room 64°, in the duct 60°. The curing-room is divided and the rooms had not gone over 70°. The owner was very well pleased with the working of the duct. Mr. Williams wrote on Nov. 18th, " My duct cost me $60, but I would not be without it for a good deal more than this sum. In the hottest weather my curing-room never rose more than three degrees."

The Dunboyne Cheese Co., in Elgin Co., put in a duct about 80 feet long—60 outside the factory and 20 under the factory. The depth is 6 ft. at the inlet end and only about 3 ft. deep under the factory. It has 3 rows of 6-inch drain tile—2 in the bottom and one on top. The intake pipe is 25 feet high, made of galvanized iron, 10 inches in diameter with cowl on top. The air enters the curing-room through a house register set in the floor about the middle of the room. There are two outlets for the warm air from the room. At two o'clock in the afternoon of July 31st the temperature in the shade outside was 73°, in the curing-room it was 69°. Velocity of wind outside 200 to 300 ft. per minute; inside, 50 to 80 ft. per minute. I was unable to get the cost of the duct as none of the officers of the cheese company were present. The maker informed me that the results had not been so good as they anticipated, due, no doubt to the shortness and shallowness of the duct, especially as it ran through a sandy knoll which would warm quickly during hot weather.

Points in building sub-earth ducts :

1. Have the duct at least 100 ft. long, 150 to 200 ft. is better.
2. Have it at least 6 feet deep, 8 or 10 feet is better.
3. Use from 5 to 6 rows of 6-inch tile, or about 2 rows of 10-inch.
4. Have the intake pipe from 30 to 60 feet high—above all surrounding trees or buildings. It may be made of wood or galvanized iron.
5. Have the mouth of the cowl from 3 to 4 feet in diameter, and the vane so constructed that it responds readily to changes in the direction of the wind.
6. Make the connection between the intake pipe and the tile in the ground, as well as the connection between the tile and the curing-room, by means of a wooden or brick curb, or by the use of tile having an elbow for the turn.
7. Regulate the inlet of air to the curing-room by means of a register, or by a small door on hinges.
8. Regulate the outlet of warm air from the room by means of an ordinary ventilator. The height or size of this ventilator does not appear to be a very important point.
9. Have the cool air enter at one side of the room and the warm air leave at the opposite side, or have the cool air enter at two to four different points near the walls, and the warm air to leave near the centre of the room.

A duct for an ordinary factory need not cost over $60 to $100.

Methods Other Than the Sub-earth Duct.

Water.—As previously noted, the Nilestown factory has a single row of water pipe around the room and this is filled with cold spring water for cooling the room. In factories

that are so situated where they have an abundance of cold water, the curing-room may be cooled by means of water. The pipes used for cooling may also be used for heating from the boiler in cold weather, by having suitable valves and connections for heating, allow one linear foot of inch pipe for each 20 cubic feet of space to be warmed. These pipes may be conveniently arranged along two or three sides of the curing-room or between the shelves and may be used for both heating and cooling. Drip pans under the pipes would be necessary for the summer, to catch the condensed moisture of the room.

Fans.—The cheesemaker at the York factory, Mr. Bond, purposes using a "blower" or fan, similar to that used in the saw-mill at York, for cooling his curing-room. Mr. Morrison, inspected the "blower" at the saw-mill in October at my request, and sends the following notes: "I examined the saw-dust blower, of which Mr. Bond spoke when in Brantford and found it to be a wooden cylinder, two feet in diameter, having four fans 6 in. x 6 in. The cylinder makes 2,200 revolutions per minute, and the dust is forced through a 7 inch stove pipe, 35 feet long. The temperature of the air at the entrance of the blower was 63°, and at the outlet of the pipe the air came out at 53°. The proprietor claims that no matter if the air is 70° or 80° at the entrance, it will come out at 52° after it has been running for some time."

This is a method of cooling curing-rooms that is worth looking carefully into.

Compressed Air for Cooling Curing-Rooms.

In the latter part of August, Mr. Stratton, our cheesemaker, visited the following factories in eastern Ontario, to note methods adopted there for controlling temperature in cheese curing-rooms: Kingston Dairy School, Cataraqui, Collins' Bay, Bayside, Gilead, Algonquin, Domville, Glenmore, North Augusta, Roebuck, South Branch, Willow, Bishop's Mills, Farmers' Union, Farmers' Own, Old Fairfield, Rideau Valley, Roseville, Barlow, Glen Buell, Maple Grange, Orchard Valley, Newbliss, New Klondike, Addison, and Frankville.

At the Kingston Dairy School he found the rooms fitted similarly to our own at Guelph, with a sub-earth duct and ice for cooling. The most interesting factory, and about the only one visited which had done anything special to control the temperature, was Mr. J. W. Newman's, at Roebuck, in Grenville Co. Mr. Newman is a graduate of our 1899 dairy class. On his return to practical work in the spring of this year he began investigating the question of temperature in the curing-rooms, and, as a result, concluded that compressed air would best serve his purpose in maintaing a moderately uniform temperature of 60° to 65°. Mr. Newman very kindly furnished the following details of the system used in his factory:

1. The contents of our reservoir is about 140 cubic feet.
2. The contents of our curing-room is about 4,700 cubic feet or about 34 times that of reservoir.
3. Our compressor (a Westinghouse 8 in. x 8 in.) should deposit 20-43 of one cubic foot of air at each full stroke.
4. Our compressor makes about 3,300 full strokes to fill reservoir to 90 lbs. pressure in 45 minutes.
5. At 90 lbs. pressure, air is compressed about seven times.
6. At 90 lbs. pressure our reservoir contains about 1,000 cubic feet of air at natural density.
7. Emptying our reservoir from 90 lbs pressure to 0 actually cools our room from 10 to 12 degrees F., though the room is not well insulated.
8. The air to be compressed should be taken from near the ceiling of the curing-room.
9. The compressed air should be passed through brine to cool it and also to purify it. It may also be stored in brine tanks for future use.
10. It requires an average of four horse-power for 45 minutes to fill the reservoir to 90 lbs. pressure, though at 90 lbs. pressure 6 horse-power is required.

Mr. Newman adds: "I believe this system could be simplified and cheapened so as to displace all other systems for cooling to moderate temperatures."

Effect on Fat in Milk when Cows are First Put on Pasture in the Spring.

For seventeen days before the cows in the dairy herd were turned on pasture—from 5 A.C.

May 15th to May 31st—the milk from the whole herd was sampled carefully and weighed. The per cent. of fat was determined with the Babcock tester. The average per cent. of fat in the morning's milk was 3.69. In the evening it averaged 3.8 for the seventeen days. The lowest test was on the morning of May 20th, when the fat was 3.3 per cent. The highest was 4.7 on the evening of May 16th.

On June 1st the cows were turned out to pasture and the average percentage of fat in the morning's milk was 4.36 for the next seventeen days. The evening's milk averaged 4.47. The milk tested 3.5 on the morning of June 1st. The evening milk of the 1st of June tested 3.6. The morning's milk of the 2nd tested 3.9 and the evening's milk tested 3.4—the lowest test during the seventeen days after being turned out to pasture. The highest test was 5.3 per cent. of fat on the evening of June 16th. The average of both the morning and evening tests was higher during the first seventeen days on pasture than it was when the cows were in the stable and yard. This agrees with experiments made in previous years, which showed that the cows of our herd gave richer milk when first turned out to pasture than they did in the stable. This is contrary to the views of most dairymen, who are of the opinion that "grass makes thinner milk."

The cows also gave more milk on the pasture. Whether this difference in the quantity and quality of the milk was altogether due to the feed or not is an open question. The probabilities are that the difference was due more to the congenial surroundings of the cows than directly to the feed.

Changes in Colostrum Milk During 21 Milkings.

During the season tests were made with the lactometer and Babcock tests of five cows in the herd for the first 21 milkings after freshening, or dropping the calf. The cows comprised one Holstein and one Holstein grade, an Ayrshire and two Ayrshire grades. The calves were removed shortly after being dropped and the cows were milked by hand. In four cases the Quevenne lactometer would not test the specific gravity of the first milking, and in the case of two cows it would not register the gravity of the second milking.

The first and second milkings gave a decided purple tinge to the precipitate when sulphuric acid was used. This purple tinge was not apparent after the third or fourth milking. The purple tinge is probably caused by an excess of albuminoids in the milk, and points to a method whereby colostrum milk may be detected. With most of the cows the milk appeared normal after the eighth or ninth milking. In some the seventh milking appeared normal.

There was quite a marked difference in the per cent. of fat contained in the first milking of the five cows. One cow tested 8.4; the others tested 3.5, 4.1, 2.2 and 3 per cent. fat. The fat varied a great deal with the different cows and with the same cow.

Table showing lactometer readings and percentage of fat in freshly calved cows' milk, grouped in three periods:

Cows.	First 8 Milkings		Second 8 Milkings.		Third 5 Milkings.		Date of Calving.
	Average Lact. reading.	Average per cent Fat.	Average Lact. reading.	Average per cent. Fat.	Average Lact. reading.	Average per cent. Fat.	
Jean	35.2	4.2	34.2	3.25	32.36	3.14	April 10, 1899.
Patience	36.7	3.77	33.62	3.59	34.10	3.44	April 24, 1899.
Meg	33.14	3.72	32.60	3.94	32.70	3.60	April 25, 1899.
Ethel	34.95	2.95	33.24	3.59	32.00	3.90	Aug. 28, 1899.
Elsie	25.48	3.13	33.94	3.24	33.86	3 00	Aug, 28, 1899.
Average	35.09	3.55	33.52	3.52	33.00	3.41	

1. There was a gradual decrease in the per cent. of fat and the per cent of solids not fat with three cows, and a decrease of the solids not fat in the milk of all five cows from the 1st to the 21st milking. In the case of one cow, Ethel, an Ayrshire grade, the per cent. of fat increased from the 1st to the 21st milking, while another grade Ayrshire was lower in fat for the first eight milkings, then increased, and afterwards decreased.

2. Milk is not normal until the 8th or 9th milking after calving, and in some cases the 12th or 14th milking contains an abnormal proportion of solids not fat.

Pasteurized vs. Raw Skim-milk for Calves.

This is an experiment similar to one reported last year. The conditions were much the same as those of last year. Four calves were selected for the experiment, two of which belonged to the dairy breeds and two to the beef breeds. One of each was placed together for feeding, and the surprising thing was that the two calves belonging to the dairy breeds made greater gains than the other two—118 lbs. as against 97 lbs. The gains were not so good as last year in either lot. In addition to the milk and meal, given as reported in the table, each calf was given silage, hay, grass, and green peas and oats according to their appetites.

Name.	Breed.	Dropped.	Lbs. milk consumed in four weeks.	Kind of milk.	Lbs. meal—corn meal and bran in equal parts	Lbs. grain during four weeks.	Period.
1. Whitehead	Grade Hereford steer.	Dec. 22, 1898	616	Pasteurized.	14	23	May 9 to June 6.
			560	Raw	28	16	June 13 to July 11.
2. Lily	Jersey	Nov. 10, 1898	616	Pasteurized.	14	14	May 9 to June 6.
			560	Raw	28	27	June 13 to July 11.
3. Dora	Grade Shorthorn	Jan. 28, 1899	616	Raw	14	28	May 9 to June 6.
			560	Pasteurized.	28	30	June 13 to July 11.
4. Topsy ...	Grade Holstein	Dec. 31, 1898	616	Raw	14	34	May 9 to June 6.
			560	Pasteurized.	28	43	June 13 to July 11.

1. The total gain of the four calves when fed on pasteurized skim-milk was 110 lbs. The total gain on raw milk was 105 lbs. In 1898, the gain on pasteurized skim-milk was 20 lbs. more than the gain on raw skim-milk. There is thus an agreement in the two years' experiments in favor of the pasteurized, or scalded skim-milk for calves.

2. We would recommend creameries to scald the skim-milk before returning it to patrons. Pasteurized (heated to 160°) skim-milk, along with meal, makes excellent food for young stock.

Dilution Creamers, or "Separators," so-called.

In the spring of the present year we received a number of letters in reference to the value of dilution "separators." Among those we were asked to pass an opinion upon were the "Hydro-lactic," made by J. F. Gill & Co., Niagara Falls, Ont.; the "Wheeler," made in Syracuse, N.Y.; and the "Aquatic," made in Watertown, N.Y.

Method of creaming.	Lbs. milk set.	Average per cent. fat in whole milk.	Average time set. Hours.	Per cent. milk taken as cream.	Per cent. fat in skim-milk.	Quality of Butter.			
						Flavor, 45.	Grain, 25.	Color, 15.	Total, 0.
April Experiments.									
Hydro-lactic	480	3.9	14.5	17	0.60	37	24	14	90
Diluted in Cooley cans	330	3.9	15.5	18	0.62	36	24	14	89
Brampton (no water added to milk)	345	3.9	20.6	16	0.68*	38	24	15	92
November Experiments.									
Hydro-lactic	300	4.0	24	.....	0.53	.....	.....	.....	.....
Wheeler	300	4.0	24	.....	0.50	.....	.....	.....	.....
Cooley (undiluted)	300	4.0	24	...	0.50	.....	.....	.....	.....

* On April 15th and 16th the per cent. fat in Brampton skim-milk was 1.2 and 1.0, which caused the high average for this creamer.

The manufacturers kindly furnished us with one each of the "Hydro-lactic" and "Wheeler." During April, 13 experiments were made comparing the "Hydro-lactic" with the Brampton creamer, and also with milk set in Cooley cans, diluted with one-half

water. The cans of diluted milk were set on the floor of the basement and not in water. Ice water surrounded the cans set in the Brampton creamer. In the "Hydro-lactic," an equal quantity of milk and cold water were placed in the "separator," or creamer—a more correct name. The milk set in the three creamers was first thoroughly mixed together and then divided into three parts, and about the same quantity was set in each. The table shows the main points of experiments made when the cows were in the stable during the months of April and November.

1. There was little or no advantage gained by using the dilution creamers as compared with the ordinary creamers, in which the milk was set in ice water without dilution. In neither cases were the results satisfactory. The loss of fat in the skim-milk was too great. The centrifugal cream separator would remove practically all of the fat.

2. The results were more unsatisfactory by allowing the milk to sit but three to four hours after diluting, as recommended by the manufacturers.

3. As good results were obtained by diluting in an ordinary shot-gun, or Cooley can, as by the use of the "separator," though the cans are not so convenient.

4. The quality of the butter and skim-milk was not so good from the dilution methods.

5. If a dairyman had not ice, cold water, or a centrifugal separator, and did not value the skim-milk, or was in the habit of diluting the skim-milk "to make it go round," he might use the dilution system to advantage. It would then become a question whether he should pay the price asked for these "separators" or use an ordinary shot-gun can, which would give him just as good results, though not quite so convenient. Adding water to the milk in order to help the cream to rise might also be an advantage with "stripper" or "farrow" cows' milk, as it reduces the viscosity and enables the cream to rise more readily.

Ripening Cream with Different Percentages of Starter.

These experiments are a continuation of those made in 1897 and 1898. Twelve experiments were made in August and September by using no starter in some cases, 5 per cent. in others, and 15 and 20 per cent. in others. The cream was first thoroughly mixed and then evenly divided into two lots by carefully weighing the cream. The starter was added at once after dividing the cream, and the two lots kept at the same temperature until thickening, when it was cooled to churning temperature. Where no starter—or not more than 5 per cent.—was used, it was not cooled until the following morning. When 15 to 20 per cent. starter was used, the cream was cooled to churning temperature the same evening that the starter was added, and allowed to stand at the lower temperature during the night

Altogether there were used in these experiments 15,831 lbs. of milk, containing an average of 3.4 per cent. fat. The average per cent. fat in the skim-milk was 0.125. The average per cent. fat in the buttermilk was nearly one-tenth, being slightly less where 5 per cent. starter was used. The acidity of the cream at churning was .49 with no starter, .59 with 5 per cent. starter and .61 and .55 with 15 and 20 per cent. starter. The yield of butter was slightly greater in those churnings where 20 per cent. of starter was used in ripening the cream. The score of the butter was:—

Per cent. starter in cream.	Flavor. (45)	Grain. (25)	Color. (15)	Salting. (10)	Package. (5)	Total. (100)
	Av.	Av.	Av.	Av.	Av.	Av.
No starter	41.7	23	13.3	10	5	93
5 per cent. starter	41.0	24	13.0	10	5	93
15 " "	41.8	23.3	13.2	10	5	93.3
20 " "	41.0	24.2	13.2	10	5	93 4

The starter caused the cream to ripen more quickly, but there was little or no difference in the quality of the butter. This agrees with the results obtained for the past two years.

Ripening Cream at Different Temperatures.

During July and August 21 experiments were made similar to those of last year to note the effects of ripening cream at a moderately high temperature (70° to 75°) and ripening a portion of the same cream at a temperature of 55° to 60°. Altogether there were used in the experiments 26,986 lbs. milk, containing an average of 3.44 per cent. fat. After separating, the cream was thoroughly mixed and then equally divided in two cream vats.

	Cream ripened at 70° to 75°.	Cream ripened at 55° to 60°.
Average per cent. acid in cream at churning time	.571	.508
" " fat in buttermilk	.072	.074
" time for churning	30 mins.	34 mins.
Total lbs. butter made	495.5	497.5
Pounds butter made per 1,000 lbs. milk	36.7	36.8
Average per cent. of overrun	6.7	7.2
" score of flavor (Max. 45)	41.1	42.4
" " grain (" 25)	23	23.8
" " color (" 15)	13.3	14
" total score (" 100)	92.2	95.2

The yield of butter was slightly greater from ripening at the lower temperature, and the quality of the butter was also somewhat better—three points as the average of 21 lots. This agrees with previous results. We have had best results in summer from ripening at a temperature not over 65°, though the difference in quality of butter is not very great, as shown by the average of three years' experiments.

Pasteurizing Milk and Cream for Buttermaking.

During April and May two series of experiments were conducted to see the effect of pasteurization on milk for buttermaking. A "Reid pasteurizer" was used for the work. The milk was first thoroughly mixed in a 3,000 lb. vat; then one-half was carefully weighed and run through the pasteurizer. The other half was separated at 95° to 100° and heated in an ordinary channel heater. The next day the milk for separating at ordinary temperature was weighed out first, and the remainder pasteurized in order to check any differences there might be as a result of the weighing and handling. The temperature for pasteurizing ranged from 155° to 162°. The total quantity of milk used in these experiments was 52,968 lbs. Average per cent. fat in whole milk, 3.5. The average per cent. fat in pasteurized skim-milk was .042; unpasteurized, .1. There were 3,119 lbs. cream from the pasteurized milk and 3,496 lbs. from the unpasteurized. The average per cent. fat in the cream from pasteurized milk was 27.3; from raw or unpasteurized, 25.6. The average per cent. acid at churning in the cream from pasteurized milk was .515; from raw or unpasteurized, .498. Time of churning, 29.9 minutes and 33 minutes, respectively. The average lbs. of butter per 1,000 lbs. pasteurized milk was 39.7; unpasteurized, 40.2. The per cent. of overrun was 13.5 and 14.9 respectively from pasteurized and raw milk.

In the first series, from April 4th to 25th, the butter was packed in 56-lb. boxes. Six boxes of butter from pasteurized milk and six from raw milk were sent to Thos. Ballantyne & Sons, Stratford, for scoring. An equal number of every other day's make was sent to D. Derbyshire & Co., Brockville, for scoring. We requested from each that an odd and even numbered box should be retained for scoring at the end of one month and again at the end of three months. These firms were not aware as to how the butter had been made or what the numbers referred to. Messrs. Derbyshire & Co. spoke of the shipment in the highest terms of praise. Messrs. Ballantyne & Sons say they find that the reports of their scorers usually compare very closely with reports of scores received from Manchester. We are indebted to these firms for their kindness in scoring and storing the boxes sent to them.

TABLE SHOWING SCORES OF PASTEURIZED AND UNPASTEURIZED BUTTER.

Butter.	Scorer.	Date of Scoring.	Flavor. (45)	Grain. (25)	Total. (100)
(1st series.)			(Average.)	(Average.)	(Average.)
Unpasteurized	Thos. Ballantyne & Sons	May 8th	41.3	23.3	94.5
Pasteurized	" "	" 8th	41 6	23·1	94.8
Unpasteurized	D. Derbyshire & Co	" 17th	42.5	24.5	97.0
Pasteurized	" "	" 17th	43.6	24.6	98.3
(2nd series.)					
Unpasteurized	Thos. Ballantyne & Sons	June 12th	43.2	22.2	95.5
Pasteurized	" "	" 12th	42.5	23.0	95.5
(1st series.) One of each box scored three times.					
Unpasteurized	Thos. Ballantyne & Sons	May 8th	43	24	97
Same box unpasteurized	" "	June 12th	35	23	88
" "	" "	Aug. 17th	31	24	80
Pasteurized	" "	May 8th	42	23	95
Same box pasteurized	" "	June 12th	40	23	93
" "	" "	Aug. 17th	38	24	87
Unpasteurized	D. Derbyshire & Co	May 17th	44	25	99
Same box unpasteurized	" "	June 21st	42	25	95
" "	" "	Aug. 11th	40	25	95
Pasteurized	" "	May 17th	42	25	97
Same box pasteurized	" "	June 21st	40	25	95
" "	" "	Aug. 11th	39	25	94
(2nd series.)					
Unpasteurized	Thos. Ballantyne & Sons	June 12th	44	23	97
"	" "	Aug. 17th	39	24	92
Pasteurized	" "	June 12th	42	23	95
"	" "	Aug. 17th	38	24	91

From May 22nd to May 29th a second series was completed. Five boxes of each (pasteurized and raw milk butter) were sent to Thos. Ballantyne & Sons for scoring. There was also in this lot a box each made from pasteurized and raw cream. The butter was scored on June 12th. Two boxes—one of each kind, made on the same day and from the same milk—were scored again on Aug. 17th, having been kept in the firm's cold storage in the meantime. The table shows the average scorings in flavor, grain and totals as given by each firm; also detailed scoring of flavor, grain and totals for the boxes kept, to test keeping quality of the butter from pasteurized and raw milk.

CONCLUSIONS:

1. There was less loss of fat in the skim-milk from pasteurizing the whole milk before separating.

2. There was less volume of cream from pasteurized milk, but the cream was richer.

3. By using a starter, after cooling, there was no do difficulty in ripening the cream from pasteurized milk.

4. The pasteurized cream churned in less time than the raw cream.

5. The yield of butter, per 1,000 lbs. of milk, was .89 lbs. greater from the unpasteurized milk. (This may have been due to a dryer butter having been made from the pasteurized milk, and more moisture left in the raw milk butter.)

6. There was not much difference in the quality of the butter when first made. The average of the first scorings from both firms was 42.6 for flavor and 23.6 for grain in the pasteurized. The unpasteurized averaged 42.2 and 23.3 for flavor and grain.

The three boxes of pasteurized butter which were scored several times, averaged 42 in flavor, and 23.6 in grain on the first scoring. The unpasteurized averaged 43.6 and 24 for flavor and grain. The second scorings were 39.3 and 24 for flavor and grain of the pasteurized, and 38.6 and 24 for the unpasteurized. The third scorings were 38.5 and 24.5 for the pasteurized and 35.5 and 24.5 for the unpasteurized in flavor and grain.

One box of pasteurized butter scored 100 points by Derbyshire & Co. Thirteen boxes of unpasteurized butter scored 95 points and over, and sixteen boxes from the pasteurized milk scored 95 points or over.

In the first series, the box of pasteurized butter sent Ballantyne & Sons, scored 42 for flavor on May 8th; 40, on June 12th; and 38, on August 17th The unpasteurized box made on the same day and from the same vat of milk scored 43, 35, and 31 on the same dates. The box of pasteurized butter held its flavor much better than the butter made from unpasteurized, or raw, milk

The box of unpasteurized butter kept by D. Derbyshire & Co., in cold storage, scored higher at all three scorings, though the pasteurized butter lost but three points in flavor during the three months, while the box of unpasteurized lost four points in the same length of time and under the same conditions.

In the second series, the box of unpasteurized sent to Ballantyne & Sons scored higher than the pasteurized (44) when first examined, and was still higher (39) when scored two months later, but it lost *five* points in flavor in the two months, while the box of pasteurized butter made on the same day and out of the same milk, lost but *four* points in flavor, scoring 42 and 38 in the two tests.

All the trials indicate that the pasteurized milk butter had better keeping quality, though when first made there was little or no difference in the quality. The chief advantage in pasteurization is in making butter for the export trade or for storing; and also in winter, when feed and other bad flavors give the butter-maker trouble.

7. By pasteurizing we found that the skim-milk kept sweet from 24 to 48 hours longer than the skim-milk from the separator where the whole milk was not heated to 160°. The same results may be obtained by heating the skim-milk *after* separating.

Mangels vs. Turnips Fed to Cows for Buttermaking.

Early in April we commenced an experiment to ascertain the difference in the quality of butter from cows fed on turnips and mangels. The cows on one side of the stable were given all the mangels they would eat, along with other food; and those on the other side were given all the turnips they would eat, along with other food. Owing to the scarcity of roots, the experiment was not continued for a sufficient length of time to come to any definite conclusions as to the relative merits of these two roots for the production of butter. The average score of the turnip butter was 37 for flavor, while the mangels produced butter which scored an average of 39.3, out of 45, indicating that the mangels were slightly superior for producing good flavor, although there was not the difference in flavor which we expected.

The Dairy Herd.

We maintain a herd of about 30 milking cows and heifers in the Dairy department, of which about 25 are in milk all the time. On December 31st, 1899, we have the following pure-breds:—5 Holstein cows and heifers and 3 calves, 4 Jerseys and 3 calves, 1 Ayrshire cow and 1 heifer calf, 21 grade cows and heifers and 3 grade heifer calves.

The milk from the herd is weighed at the dairy and a sample taken the same as if the milk came from a patron. At the prices paid patons for milk this past season, our cows furnished by months the following values:—January, $135.57; February, $135.14; March, $128.00; April, $163.32; May, $128.99; June, $132.41; July, $112.22; August, $103.69; September, $113.56; October, $96.41; November, $105.90; December, $90.56, making a total for the year of $1,445.77. In addition, a considerable quantity of milk is used for rearing young calves, and about five dollars per month is received for milk sold by the quart to customers who come to the dairy stable for it. Outside of the milk used

for rearing stock, the milk supplied by the dairy herd was worth during the past year over fifteen hundred dollars at the prices we are compelled to pay in the vicinity of Guelph for milk to be used in the Dairy School and for experimental purposes.

The record of all cows which have been in the herd for the full time of the year ending November 30th, 1899, is as follows :

Name of cows.	Weight.	Calved.	Breed.	No. days milking.	Total lbs. milk.	Per cent. fat.			Total lbs. fat.	Total lbs. butter, adding 15 % to butter fat.	Remarks.
						Highest weekly.	Lowest weekly.	Yearly average.			
Annie	1,195	Nov. 12. '98.	Jers.' Grade.	304	7,400	4.6	3.3	4.04	299.46	344.38	
Belle Temple.	980	Jan. 2	Jersey	315	5,576	6.1	4.0	4.87	271.68	312.43	
Bella..... ..	1,195	July 17	AyrshireG'd	355	6,107	4.5	2.8	3.8	232.62	267.51	3 yrs. old, 2d calf.
Birdie.....	1,165	Dec. 22, '98.	Grade.....	335	7,185	4.3	3.5	3.9	280.34	322.39	
Dolly.....	1,210	Oct. 31.....	Hol. Grade.	286	6,000	3.6	3.0	3.4	205.10	235.86	3 yrs. old, 1st calf.
Elsie	1,093	Aug. 27	Ayr. " .	227	4,721	3.8	2.9	3.28	155.35	178.65	
Ethel	820	" 28	" " .	223	4,952	4.2	3.4	3.8	192.74	221.65	
Grey	1,150	Feb. 26.....	S.-H. " .	281	9,052	5.1	3.0	3.44	311.74	358.50	
Jean.....	925	Ap'l 10. ...	Hol. " .	223	6,382	4.5	3.3	3.5	223.52	257.05	
Jennie	1,055	Mar. 1	Ayr. " .	275	5,730	3.8	3.0	3.24	186.04	213.94	(9 mo's.)
Lilly	943	Nov. 16	Jersey	299	5,455	6.2	3.4	5.5	302.46	347.83	
Lucy.....	1,045	Dec. 18. '98.	H. Grade...	335	7,012	3.8	2.9	3.48	244.31	280.95	2 yrs. old, 1st calf.
Margaret.....	1,576	Aug. 19	Holstein ...	270	9,128	4.2	2.8	3.45	315.66	363.00	
M. Cornelius..	.....	May 7	" ...	214	4,860	3.2	2.1	2.6	125.26	144.04	2 yrs. old, 1st calf (7 mo's).
Molly.....	1,195	Nov. 20, '98.	H. Grade ..	350	8,345	4.6	3.0	3.6	302.34	347.69	3 yrs. old, 1st calf.
Moss	1,041	May 26	J. " ..	308	6,208	6.4	3.7	4.65	289.15	332.52	
Megg.....	1,365	Ap'l 25.....	Holstein ...	214	7,145	4.6	2.8	3.3	236.98	272.52	
Nellie.... ...	972	Nov. 4.....	Grade.....	282	5,334	4.4	3.1	3.9	209.07	240.43	
Ont. Belle....	986	Aug. 11	Jersey	320	4,490	6.8	4.0	5.7	255.77	294.13	
Patience	1,190	Ap'l 24.....	Ayrshire ...	266	7,273	5.2	3.0	3.68	268.26	308.49	
Polly	1,235	Dec. 31. '98.	Hol. Grade.	305	6,815	3.9	3.0	3.35	227.59	261.72	3 yrs. old, 1st calf.
R. Burnette ..	912	Feb. 26	Jersey	280	7,892	6.4	3.0	4.16	338.08	388 79	
Wedo	1,202	Oct. 4.....	Holstein ...	291	8,707	3.6	2.0	3.1	273.94	315.03	

1. The largest producer of milk was a Holstein cow, which gave 9,128 lbs. during the year. The second largest producer was a Shorthorn grade, and the third was a Holstein, and the fourth a Holstein grade heifer, 3 years old, after first calf.

2. The largest butter-producer was a Jersey cow with a record of 398 lbs. of butter, which is 48 lbs. below her record for last year. The second was a Holstein, the third a Short-horn grade, the fourth a Jersey, and the fifth a Jersey grade. (Butter was calculated by adding 15 per cent. to milk fat.)

3. The percentage of fat from individual cow's milk varied from 2 to 6.8 in the weekly or monthly composite samples. The yearly average percentage of fat varied from 2.6 to 5.7.

4. The lowest production of butter by one cow for a full year was 178.65 lbs. Her record last year was 222 lbs. We shall dispense with her services at an early date, though she was bought for a " record-breaker."

5. The lowest yield of milk by one cow was 4,490 pounds, but this cow's milk averaged 5.7 per cent. fat, consequently her butter record is very fair.

6. The number of days during which the cows were milking varied from 214 to 355, Bella, an Ayrshire grade heifer having milked practically the whole year, though she is not doing so well at present as she would have done had she been dry six weeks to two months.

7. The live weight of the cows varied from 820 lbs. (an Ayrshire heifer registered in Appendix) to 1,576 lbs., the weight of a pure-bred Holstein, the cow which gave the largest quantity of milk. The live weight of the largest butter-producer is 912 lbs.

Milk Tests at the Fall Fairs.

I took charge of the milk tests at Toronto and Brantford Fairs. Mr. Stratton took charge at Straffordville and Aylmer Fairs. At Toronto, the awards were made to the cows producing the greatest weight of milk solids in 48 hours. At Brantford, Straffordville and Aylmer the prizes were awarded according to the Provincial Dairy Show scale of points (old scale). At Brantford the test was for 24 hours; and at the other two fairs, the time was but six hours, which is far too short to be satisfactory.

Toronto, Sept. 4 and 5, 1899. Test, 48 Hours.

Rank.	Name of Cow.	Breed.	Owner.	Lbs. milk in 48 hours.	Lbs. fat in 48 hours.	Lbs. solids in 48 hours.
1	Daisy Banks	Holstein	Rettie Bros., Norwich	126.5	3.064	13.994
2	Inka Sylvia	"	C. J. Gilroy, Glen Buell	128.5	3.373	13.507
3	Highland Cornelia	"	Retty Bros	129.5	2.746	13.398
4	Queen de Kol 2nd	"	G. W. Clemons, St. George	120.25	2.939	12.632
5	Princess Lida 4th	"	C. M. Keeler, Greenbush	116.00	2.821	12.530
6	Juanita	"	C. J. Gilroy	111.50	2.750	12.226
7	Nellie Gray	Ayrshire	N. Dyment, Clappison	111.25	2.960	12.219

Brantford, Sept. 20th, 1899. Test, 24 Hours.

Rank.	Cows.	Owner.	Lbs. milk.	Lbs. fat.	Lbs. solids not fat.	Points scored.
1	Highland Cornelia	Rettie Bros	70.75	1.981	6.230	74.94
2	Daisy Banks	"	61	1.464	5.185	59.42
3	Jane	Jas. Britton	31	0.992	2.790	58.70
4	Nellie Gray	N. Dyment	53	1.431	4 369	58.02

Straffordville, Sept. 20th, 1899. Test, 6 Hours, 3 Cows.

1	Three cows	A. Jackson	24	0.978	2.207	160.48
2	"	T. H. Mason	21	0.870	1.849	122.09
3	"	E. A. Garnham	11.25	0.370	1.028	104.75

Straffordville, Sept. 20th, 1899. Test, 6 Hours, 1 Cow.

1	One cow	E. Jackson	10.25	0.358	0.902	57.21
2	"	S. Murphy	4.25	0.233	0.399	40.70
3	"	B. Snell	4.50	0.198	0.401	40.36
4	"	D. Spiece	6.25	0.193	0.560	35.45
5	"	E. A. Garnham	2.75	0.060	0.253	29.96

Aylmer, Sept. 22nd, 1899. Test, 6 Hours, 3 Cows.

1	Three cows	Wm Pound	32 37	1.152	2 895	98.30
2	"	C. M. Clark	25.25	0.998	2.193	89.32
3	"	P. Abbott	24.25	0.907	2.198	88.63
4	"	C. M. Clark	18.37	0.768	1.597	83.14

Aylmer, Sept. 22nd, 1899. Test, 6 Hours, 1 Cow.

1	One cow	R. Bingman	8.12	0.324	0.748	30.1
2	"	P. Abbott	9.25	0.397	0.848	29.6
3	"	C. M. Clark	11.25	0.438	0.947	29.
4	"	D. McLennan	14.25	0.370	1.249	20.3

Testing Apparatus, Rennets, Cheese and Butter Colors, etc.

As usual, we have had numerous requests for tests of dairy apparatus and dairy supplies. We aim to comply with these so far as possible. We have tested the following with more or less satisfactory results : The Cumming's Churn, Cornett's Milk Agitator, Hydro-lactic Creamer, Wheeler Gravity Creamer, Swedish Cheese and Butter Colors, Swedish Rennet, Boyer's Rennet Powder, and Alderney Butter Color. As there has been considerable agitation during the past season in reference to "dilution creamers", we report the results of tests made with the Hydro-lactic and Wheeler in detail elsewhere. The Cornett Milk Agitator is a very ingenious device for stirring milk and preventing the cream from rising during the night.

We have also been using "Formalin" on our cheese for preventing mould and have found it quite satisfactory this season, although there has not been so much mould this year, as in other years, a fact due, no doubt, to the very dry season and cool nights. An ex-student of the College reports that he has used a strong brine on his cheese with satisfactory results in preventing mould.

Improvements of the Year.

Early in the season we thoroughly disinfected the cheese curing-rooms and had the nside painted. This was necessary as we found a few of our Dairy School cheese mottled ; and the mottling was no doubt caused by having had mottled cheese for experimenting purposes in the rooms. We should have a special curing room for cheese of this class.

In the month of June, a receiving room for milk delivered to our home dairy was built at the north side of the home dairy building. It serves the purpose of a room for aerating experiments and for holding the home dairy milk at nights.

In September, we enlarged the home dairy department by taking in the adjacent lecture room, as our quarters were too small, especially for our regular college classes The instructions given to our college students has not been satisfactory until the present year. We can now accomodate a class of 40 to 50 in the home dairy department alone. We have six makes of hand separators, hand and turbine Babcock testers, and four or five hand churns, together with butter workers, etc., so that we are able to give a very thorough course in practical farm dairy work, which supplements and illustrates the lectures to first year students. Second year students will take some home dairy work and will also take the special creamery course in December.

Our home dairy will also be the college creamery for the summer months, and is nearly as complete as we could wish.

Needs of the Dairy department.

1. An up to date refrigerator plant.
2. Dairy stables put in good repair.
3. Excellent specimens of the leading dairy breeds. We ought to have some of the best females that can be purchased.
4. Dairy buildings repainted outside.

All of which is respectfully submitted,

H. H. DEAN,

Professor of Dairy Husbandry.

Ontario Agricultural College,
Guelph, Dec. 30, 1899.

PART VIII.

PROFESSOR OF AGRICULTURE.

To the President of the Ontario Agricultural College:

SIR,—I have the honor to submit herewith my seventh annual report.

As a detailed statement of my work would not be of general interest, I shall restrict my report to summarizing some of our results in live stock experiments, with some additional observations under the heading of *Farm Superintendence.*

HEAVY, MEDIUM AND LIGHT MEAL RATIONS FOR FATTENING STEERS.

This experiment is the third of a series of experiments with different quantities of meal for fattening steers. Nine steers were divided into three groups, making three steers in each group. With the heavy ration group an effort was made to feed one pound of meal per day per hundred pounds live weight of the animals. They would not all eat this quantity, so they were kept as near the limit as was deemed safe. With the medium ration group, the aim was to feed about to two-thirds of a pound of meal per day per hundred pounds live weight of the animals. The steers in the light ration group were started on about one-third of a pound of meal per day per hundred pounds live weight, and this quantity was increased as deemed advisable. The method of feeding may be made clearer by means of a table, and the table given below shows approximately how the meal rations were increased.

Period.	Heavy ration. Meal per steer per day.	Medium ration. Meal per steer per day.	Light ration. Meal per steer per day.
	lb.	lb.	lb.
Dec. 6th to Jan. 3rd	10	8	4
Jan. 3rd " Feb. 1st	11	8	5
Feb. 1st " Mar. 1st	12	9	6
Mar. 1st " April 1st	12.5	9	8
Apr. 1st " May 23rd	12.5	9	9

The meal rations given in the table are merely approximations. The meal actually consumed by the heavy ration group amounted to nearly nine-tenths of a pound of meal per day for every hundred pounds of the average live weight of the animals throughout the feeding period. The medium ration group averaged two-thirds, and the light ration group slightly over one-half of a pound of meal per day for every hundred pounds of the average live weight of the animals throughout the feeding period.

The meal ration consisted of equal parts by weight of corn and oats.

The remainder of the ration consisted of mixed clover and timothy hay of poor quality and roots. The hay was cut and mixed with pulped roots a day in advance of feedings, in the proportion of twenty pounds of roots to fifteen pounds hay. All food was carefully weighed. The experiment lasted 168 days.

The foods were valued as follows: meal, $13; hay, $6; and roots $2 per ton. These valuations are purely arbitrary, but they serve as a basis of comparison, which is all that is required. Below is given a statement of the gains made by the steers and the cost of a pound of gain:

In 1899.

Heavy Ration	:	Average	daily	gain,	1.77	lbs.	Cost	of 1 lb.	gain, 7.68c.
Medium "	:	"	"	"	1.74	"	"	"	" 7.22c.
Light "	:	"	"	"	1.62	"	"	"	" 7.21c.

For the sake of comparison, the average results of three experiments in three successive years, are given below :

In 1897, 1898, and 1899.

Heavy Ration	:	Average daily gain,	1.75	lbs.	Cost of 1 lb. gain,	7.25c.
Medium "	:	" " "	1.70	"	" " " "	6.69c.
Light "	:	" " "	1.61	"	" " " "	6.53c.

Summary and Suggestions.

1. In each of three trials, covering a period of 216, 179, and 168 days respectively, a comparatively heavy ration gave larger but more expensive gains than those obtained with lighter rations.

2. In the average of three trials, the most economical gains were obtained by commencing with about one-third of a pound of meal per day per hundred pounds live weight of the animals, and gradually increasing as circumstances demanded.

3. In two of the trials the groups that made the most economical gains received, on an average, very little more than half a pound of meal per day per hundred pounds of their average live weight during the feeding period.

4. Other experimenters have shown that the cost of producing a pound of gain increases as the animals become fatter; therefore a finished steer is fed at a loss. From this it would seem that, to feed economically, an effort must be made not to have the steers finished for any considerable time before they can be disposed of. No doubt the light ration obtained some of its advantage through more nearly meeting the conditions favoring economical feeding, as given above.

5. No fixed rules can be given regarding the rate of increase in the meal ration. Each feeder must be guided by his judgment, and what has been said regarding the methods employed in these experiments can be taken only as a general guide.

6. The more attention paid to making the coarse fodders palatable, the better the results obtained from a given quantity of meal.

7. The experiments described deal only with somewhat protracted feeding periods. Shorter feeding periods would no doubt call for a considerable modification of methods, and a more rapid increase in the meal ration.

Mangels vs. Sugar Beets for Milk Production.

In order to test the comparative value of mangels and sugar beets for milk production, two experiments, each with different cows, have been completed, the first of which was reported in last year's annual report.

In each trial four cows were used. After a week's preparatory feeding the rations were changed. Two of the cows were fed sixty pounds of sugar beets per cow per day for two weeks; then they were fed sixty pounds of mangels per cow per day for two weeks. The other two cows were fed sixty pounds of mangels per cow per day during the first two weeks, and then changed to sixty pounds of sugar beets per cow per day during the next two weeks. Thus each cow was fed two weeks on sugar beets and two weeks on mangels. In addition to the roots the cows received a meal ration and what clover hay they would eat, each cow receiving like quantities of hay and meal.

In the first trial the four cows produced 1268 lbs. of milk on sugar beets, and 1275.5 lbs. of milk on mangels.

In the second trial the four cows produced 1230.25 lbs. of milk on sugar beets, and 1238.5 lbs. of milk on mangels.

1. In each experiment there is a slight difference in the total milk yield in favor of the mangels, amounting to 7.5 lbs. in one case, and 8.25 lbs. in the others, in the milk produced by four cows in two weeks.

2. In the first trial, cow No. 1 decreased in milk flow, and cow No. 2 increased in milk flow after being changed from sugar beets to mangels; and both cows 3 and 4 decreased in milk flow after being changed from mangels to sugar beets. In the second trial, all the cows gave more milk during the second two weeks than during the first two, but the cows that were changed from sugar beets to mangels made a greater increase, on the whole, than those that were changed from mangels to sugar beets.

3. Everything considered, these experiments indicate that there is very little, if any, difference between mangels and sugar beets as foods for stimulating the flow of milk. It must be remembered, however, that these experiments have no bearing upon the relative value of these foods for maintaining life or producing fat.

Experiments with Pure Bred Swine.

Fig. 1. This hog gave a first-class side of bacon.

Fig. 2. A good bacon hog, but standing badly. Note, however, the high neck and jowl.

This experiment constitutes the fourth experiment in which representatives of six different breeds of swine were fed side by side. Six animals of each of the following breeds were used: Yorkshire, Tamworth, Berkshire, Chester White, Duroc Jersey, and Poland China. Each breed was divided into two lots of three hogs each. The experiment commenced June 13th, the hogs being at that time from 9 to 13 weeks old. Three hogs of each breed, 18 hogs in all, were fed equal parts by weight of corn and wheat middlings with skim milk. The remaining 18 hogs were fed equal parts by weight of barley and wheat middlings with skim milk. On August 10th, the meal mixture was changed to three parts grain to one part middlings by weight, corn still being used for one group and barley for the other. On September 1st, the skim milk was discontinued; and on September 15th, the middlings were dropped from the ration, the one group being fed pure corn and the other pure barley. The experiment was closed October 10th. On an average, about two pounds of skim milk to one pound of meal were fed during the time milk was used. The objects of these experiments were:

1. To compare the six breeds of swine:
   (*a*) With regard to economy of production.
   (*b*) With regard to suitability for the export bacon trade.
2. To compare corn with barley:
   (*a*) With regard to amount required for a pound of gain.
   (*b*) With regard to the quality of bacon produced.

Comparison of Breeds. In feeding the hogs, the animals were given a somewhat restricted amount of food, the aim being to keep them in good growing condition without developing an excessive amount of fat, though with some of the breeds it was a difficult matter to secure growth without too much fat. As stated before, considerable skim milk was fed, and in order to simplify comparison, the amount of dry matter in the foods has been estimated; so that instead of giving the pounds of meal and milk required for a hundred pounds of gain, we give the pounds of dry matter which the meal and milk represent.

Food Required for 100 lb. Gain, Live Weight. In this year's experiment the amount of dry matter required to produce one hundred pounds of gain, live weight, for the different breeds were as follows: Berkshire, 318.28 lbs; Tamworth, 331.16 lbs.; Yorkshire, 334.85 lbs.; Chester White, 336.68 lbs.; Duroc Jersey, 337.1 lbs.; Poland China, 349.99 lbs.

In this connection it will be of interest to note the standing of the different breeds with regard to economy of gain, in each of the four experiments which have been completed. The following table illustrates this point :

1896.	1897.	1898.	1899.
1. Berkshire.	1. Berkshire.	1. Yorkshire.	1. Berkshire.
2. Tamworth.	2. Tamworth.	2. Berkshire.	2. Tamworth.
3. Poland China.	3. Poland China.	3. Duroc Jersey.	3. Yorkshire.
4. Duroc Jersey.	4. Chester White.	4. { Tamworth. { Chester White.	4. Chester White.
5. Chester White.	5. Yorkshire.		5. Duroc Jersey.
6. Yorkshire.	6. Duroc Jersey.	6. Poland China.	6. Poland China.

A glance at this table shows that the Berkshires and Tamworths have made a remarkable good showing with regard to economy of production ; but on the whole it would appear that economy of production is more influenced by the individuality of the animals than by the breed.

Suitability for Export. At the close of the experiment the hogs were shipped to the Wm. Davis Company, Limited, of Toronto, where they were slaughtered and the carcases examined. The results of the slaughter test were practically the same as those of previous years. The Yorkshires were the most uniform lot, possessing greater length between shoulder and ham, and carrying a more uniform depth of fat along the back than other breeds. The Tamworths stood second, being more irregular in size, length of side, and depth of fat along the back than the Yorkshires. The remaining breeds were generally unsatisfactory, being characterized by heavy jowls and shoulders, short sides, an extreme thickness of fat over the shoulder tops, and, in most cases, an excessive development of fat throughout. Probably the Berkshires might be placed next to the Tamworths, as they were a rather more uniform lot than the Chester Whites, Duroc Jerseys or Poland Chinas. The Poland Chinas were all extremely fat.

We give photographs of some of the hogs used in the breed experiment. The object in inserting these photographs is to illustrate types rather than breeds.

FIG. 3. A very good hog, but a little too fat.

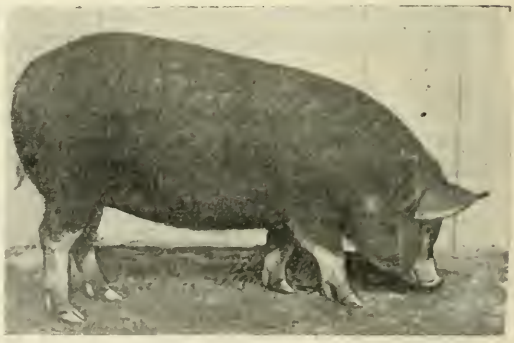


FIG. 4. Too short and chubby. Note the short arched neck and heavy jowl.

Comparison of Corn and Barley. As before stated, half the pure-bred hogs were fed corn and the other half barley. In addition, some skim-milk and middlings were fed with the corn and barley, except during about a month, at the close of the experiment, when one group was fed corn alone and the other barley alone. Owing to the unfortunate occurrence described below, this part of the experiment was very unsatisfactory and requires repetition. It may be stated, however, that, during the time milk and middlings were fed, the hogs receiving corn made the most economical gains ; but after the milk and middlings were discontinued, the hogs receiving barley surpassed those on corn in rapidity and economy of gains.

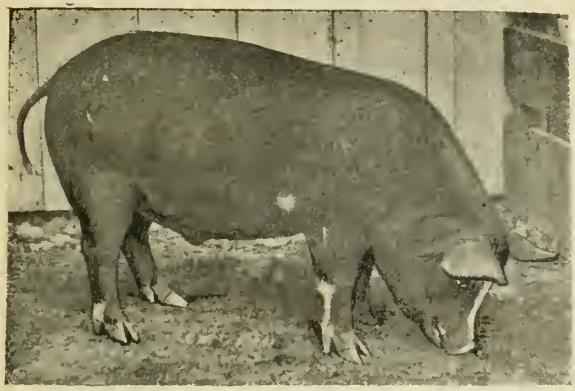


FIG. 5. A very fair hog, but the shoulder proved somewhat heavy when the animal was slaughtered.

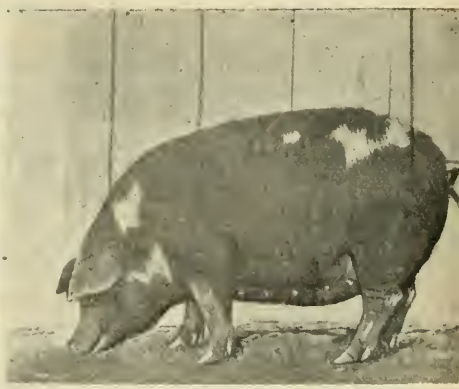


FIG. 6. Very short and fat. Too much belly. Compare with Fig. 1 in this respect.

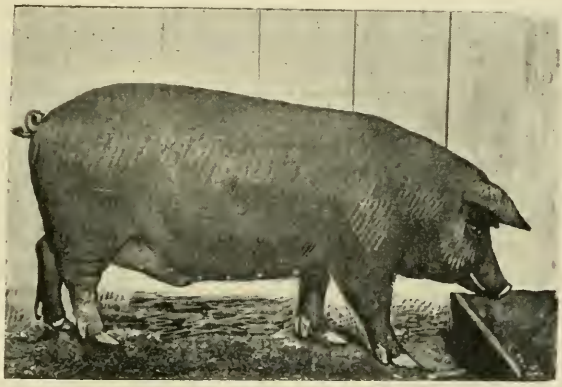


FIG. 7. A hog of fair length but entirely too fat. Compare the sagging, heavy belly with the trim belly shown in Fig. 1.

Quality of Bacon Produced. After the hogs were killed, the sides were all labelled, with the intention of having them salted separately, and examined for firmness when they came out of the salt. Owing to some misunderstanding or oversight on the part of the people connected with the factory, the sides were marketed without critical comparison after they came out of the salt. Thus the most valuable point in connection with the experiment was lost, and no part of it will be reported fully until further tests have been made. The sorter stated that some of the sides were firmer than the others, but none were rejected on account of softness. We have no record, however, as to which were the firmer. In the case of the Yorkshires and Tamworths, those fed corn were noticeably fatter than those fed barley. In the other breeds no marked difference could be detected.

Summary.

1. In each of four experiments the Yorkshires and Tamworths were pronounced by the packers more suitable for the export bacon trade than the representatives of other breeds.

2. Generally speaking, the results of four experiments indicate that economy of production is more dependent upon the individuality of animals than upon their breed.

3. The experiments indicate that it does not necessarily cost more to produce a pound of gain upon a hog of suitable bacon type than upon a hog of undesirable bacon type.

Experiments with Grade Swine.

On July 28th an experiment was commenced with grade swine, to test the value of several different rations both as regards economy of gain and the firmness of the bacon produced. Following is a a description of the plan of the experiment:

Group I., 11 hogs, average live weight at commencement, 63 lbs.

Ration: July 28th to Aug. 9th, equal parts by weight corn and middlings. Aug. 10th to Sep. 15th, 3 parts corn to 1 part middlings by weight. Sept. 16th to Oct. 10th, corn alone.

Group II., 11 hogs, average live weight at commencement, 62 lbs.

Ration: July 28th to Aug. 9th, equal parts by weight peas and middlings. Aug. 10th to Sep. 15th, 3 parts peas to 1 part middlings by weight. Sep. 16th to Oct. 10th, peas alone.

Group III., 13 hogs, average live weight at commencement, 63 lbs.

Ration: July 28th to Aug, 9th, equal parts by weight barley and middlings. Aug. 10th to Sep. 15th, 3 parts barley to 1 part middlings by weight. Sep. 16th to Oct. 10th, barley only.

Group IV., 14 hogs, average live weight at commencement, 61 lbs.

Ration: Same meal ration as Group III., except that hogs were fed only about two-thirds of the quantity given group III. In addition to the meal they were fed all the rape they would eat.

Results. Up to this period of the experiment the rate of gain and food consumed per 100 lbs. of gain were as follows:

Group I. (*Corn*): Average daily gain per hog, .79 lbs; meal consumed per 100 lbs. gain, 480 lbs.

Group II. (*Peas*): Average daily gain per hog, .61 lbs; meal consumed per 100 lbs. gain, 573 lbs.

Group III. (*Barley*): Average daily gain per hog, .80 lbs; meal consumed per 100 lbs. gain, 490 lbs.

Group IV. (*Barley and Rape*): Average daily gain per hog, .84 lb.

Food consumed per 100 lbs gain, { Meal, 324 lbs. / Rape, 750 lbs.

While middlings were fed with the peas, Group II made very satisfactory gains; but when the middlings were discontinued and clear pea meal fed, the pigs in this group did very badly. The method would not have been adopted only it was desired to test the effect of exclusive pea feeding upon the quality of bacon.

Rape gave very satisfactory results so far as economy of gain was concerned.

At the conclusion of this part of the experiment, the largest hogs in each group, about half the total number, were sent to the factory, along with the pure bred hogs, to be compared as to firmness of bacon. In this connection, however, they shared the same fate as the pure-breds, the bacon being marketed without critical examination when it came out of the salt, as was previously explained. While this was a very serious loss, it was not quite so disastrous as in the case of the pure-breds, because half the grade hogs had been retained for further feeding to make them heavy enough for export.

Second Part of Experiment.

The remaining hogs were kept in the same groups as before, and fed the same rations, with two slight modifications: the ration of Group II was changed back to 3 parts pea meal to 1 part middlings, and on Dec. 3rd rape feeding was discontinued for Group IV, the group being fed exclusively on barley from that date until the close of the experiment, a period 23 days The rations for the different groups, therefore, were as follows:

Group I: Corn.

Group II: Three parts pea meal and 1 part middlings, by weight.

Group III: Barley.

Group IV: Barley and rape until Dec. 3rd, then barley alone.

This part of the experiment lasted from Oct. 11th to Dec. 26th, or a period of 77 days.

Results. The average gain per hog, and the amount of food consumed per 100 lbs. of gain were as follows :

Group I (*Corn*) : Average daily gain per hog, .7 lb. Meal consumed per 100 lbs. gain, 547 lbs.

Group II (*Peas and Middlings*) : Average daily gain per hog, 1.12 lbs. Meal consumed per 100 lbs. gain, 455 lbs.

Group III (*Barley*) : Average daily gain per hog, 1.17 lbs. Meal consumed per hundred pounds gain, 456⅘lbs.

Group IV (*Barley and Rape*) : Average daily gain per hog, .94 lb.

Food consumed per 100 lbs. gain { Meal, 440 lbs. / Rape, 764 "

The results just given do not correspond with those obtained during the first part of the experiment, and the fact that they do not is suggestive of several things. In the first part of the experiment, the corn group made the most satisfactory gains, but during this time the hogs in this group were fed pure corn for a comparatively short time. Those hogs of the corn group which were retained were fed pure corn during the whole of the second part of the experiment, and during this time they made the poorest gains of the four groups. This indicates that exclusive corn feeding for an extended period is poor economy.

Then, it has already been noted that the hogs in Group II did very badly when fed exclusively on pea meal. But during the second part of the experiment, when middlings had been added to the ration, they made the most economical gains of the four groups. This emphasizes the already pretty well known fact that to obtain the best results from peas, they must be mixed with other foods.

On the other hand, the hogs receiving barley did better during the second part of the experiment than during the first, indicating that barley is a very safe food for hogs.

Rape did not maintain its reputation during the second part of the experiment, but a good deal of the rape fed during this time was not of good quality,

At the close of the experiment the hogs were sent to the Wm. Davies Co. of Toronto, and below is given the report of Mr. J. W. Flavelle upon the bacon of the different groups, as it came out of the salt.

Mr. Flavelle's Report.

We have to-day examined the sides made from the hogs shipped to us by you, and upon which we understand you desire us to report.

Lot I (*Corn*) : Very soft, fat, pasty and greasy, in every way undesirable. The hogs in this lot seem to have thriven well on the feed as the sides are well finished, indeed quite fat.

Lot II (*Peas and Middlings*) : Excellent quality, firm.

Lot III. (*Barley*) : Very firm, probably the most distinctly hard and firm of any of the lots.

Lot IV. (*Barley and Rape*) : Good quality, firm with a slight tendency, but very slight, towards tenderness.

Summary.

1. Exclusive corn feeding during a somewhat extended period gave very unsatisfactory results in point of gain, and produced bacon of extremely soft, undesirable character,

2. The exclusive feeding of pea meal resulted in unthrifty animals and poor gains ; but a mixture of three parts pea meal and one part middlings by weight, gave good gains and produced bacon of excellent quality.

3. An exclusive ration of barley gave satisfactory gains, and produced exceptionally firm bacon.

4. A two-thirds ration of barley with all the rape the hogs would eat, followed by about three weeks' exclusive barley feeding at the close, gave economical gains on the whole, and produced bacon of good quality, though scarcely so firm as that produced by barley or by peas and middlings.

5. Barley appears to be an exceptionally safe and valuable food for swine, whether fed alone or in combination with other foods.

6. Peas should always be fed in combination with other foods, in which case they give good results.

7. Exclusive corn feeding is no doubt risky under any conditions, but the practice cannot be too strongly condemned when followed for any considerable length of time.

Experiments in Sheep Feeding.

Alfalfa and Red Clover Hay for Lambs.

Two short experiments have been made with these foods for lambs, the first of which is described in last year's report. In the first experiment, three groups of lambs were fed red clover, first cutting of alfalfa, and third cutting of alfalfa, respectively, together with a grain ration. In the second experiment, three groups of lambs were fed red clover, first cutting of alfalfa, and second cutting of alfalfa, respectively, without grain or any other food. The first experiment continued for 74 days, and the second for 42 days.

Summary.

1. In each experiment the alfalfa hay gave slightly better results than the red clover hay.

2. In the first experiment, the third cutting of alfalfa gave somewhat better results than the first cutting, but in the second experiment, the first and second cuttings of alfalfa were practically equal.

3. In the second experiment, one lamb in the red clover group made an extremely low gain, while the other lambs in the same group made an average gain equal to that of the alfalfa groups. This would indicate that the lower average gain on red clover was due to the individuality of this one lamb rather than to the food.

4. Everything considered, it cannot be said that either of the fodders showed marked superiority over the other. The experiments indicate that the feeding values of red clover and alfalfa hay are very similar.

5. All animals continued in perfect health from the beginning to the end of each experiment, indicating that alfalfa hay is a safe fodder for sheep, if it is cut and cured at the right stage of growth, say in early bloom.

Corn vs. Peas for Fattening Lambs.

During the winter of 1897-98, two groups of lambs were fed upon equal parts by weight of ground corn and oats, and equal parts by weight of ground peas and oats, respectively, together with clover hay. The results of this experiment are given in last year's report.

During the past winter, one group of lambs was fed ground corn, another fed ground peas, and a third group was fed equal parts by weight of ground corn and peas. All groups were fed like quantities of clover hay. The lambs were started on one pound of meal per lamb per day, which quantity was increased until it reached one and one-half pounds of meal per lamb per day. The experiment lasted 104 days.

Results. Briefly stated, the gains and meal consumed per pound of gain were as follows:

Corn Group: Average weekly gain per lamb, 2.52 lbs. Meal consumed per lb. of gain, 3.80 lb.

Peas Group: Average weekly gain per lamb, 2.91 lbs. Meal consumed per lb. of gain, 3.30 lbs.

Corn and Peas Group: Average weekly gain per lamb, 2.60 lbs. Meal consumed per lb. of gain, 3.68 lbs.

Summary.

1. In the first trial, corn and oats gave a larger gain than peas and oats.
2. In the second trial, peas alone gave the largest gain, followed by corn and peas.
3. The second trial is more satisfactory than the first because it covered a longer

period of time, and because, from the method of feeding, a more direct comparison of peas and corn was obtained. It is a suggestive fact that the gain made by the group on corn and peas is intermediate between the gains made by the other two groups.

4. During the second trial, ground corn could be bought for $17 per ton, while peas cost from 60c. to 66c. per bushel. As a result, though the peas gave the largest gain, the corn gave the cheapest gain.

5. According to the results of the second trial, if pea meal is valued at $20 per ton, ground corn would be worth $17.35 per ton.

Further tests will be made.

Farm Superintendence.

Upon the resignation of the former Farm Superintendent, Mr. Wm. Rennie, on October 1st I assumed control of this important department, in addition to my other duties, having for assistants Mr M. D. Geddes, as farm foreman, and Mr. W. J. Price, B.S.A., as Fellow in Agriculture. I am pleased to say that both these young men are doing excellent work.

Hauling in Hay on the College Farm.

Owing to the fact that I have had charge of the Farm department during only the last three months of the year, I cannot give anything like a full report of the year's work. The following is a brief statement of some points which may be of general interest:

The system of cultivation was the same as that followed during preceding years, which will be found described in previous reports of the Farm Superintendent.

The summer of 1899 was exceedingly dry, the total rainfall during the months of June, July, and August being less than two and three-quarter inches. As a result the crops were not so abundant as usual, and it is doubtful whether we shall have enough of all kinds of fodder for our rather heavy stock. The dry weather was particularly trying upon newly-seeded meadows, and it is quite probable that next year we shall have some very poor meadows as a result.

Live Stock.

Cattle.—Among the beef breeds we have representatives of the Shorthorn, Hereford, Aberdeen-Angus, Galloway, and Devon breeds. We are particularly in need of fresh Shorthorn blood. Among the milch cows kept in the department there are three Holsteins, one Ayrshire, and one Jersey, the remainder being grades.

During the winter of 1898-99, twenty-four steers were fed. In the fall of the present year, sixteen steers were purchased, and they are now in the farm stables.

Sheep.—Owing to the fact that the sheep have not done particularly well upon the College farm, the flock has been considerably reduced, representatives of only four breeds being retained, namely, Cotswolds, Leicesters, Oxfords and Shropshires. Should these prove successful, it is intended to increase the flock gradually. During the past summer, Lord Polworth kindly presented the College with three Border Leicester yearling ewes and a ram lamb. The ram, however, was unfortunately killed in an accident.

Swine.—Our swine represent three breeds, Yorkshire, Tamworth and Berkshire. Representatives of other breeds are fed in the experimental department. We have been somewhat overstocked with hogs this fall on account of the changed arrangements regarding the annual sale, as is subsequently explained. Private sales have not been very satisfactory, a fact due, no doubt, to the general depression in the price of hogs.

Methods of Feeding.

While there is, perhaps, no best ration for a given class of stock, an account of our methods of feeding may not be without interest. The following descriptions will give a fair idea of the methods we are practising at present, though they are subject to modification according to circumstances.

Beef Breeds of Cows.—The bulky part of the ration consists of cut hay, chaff, silage, and pulped roots. These foods are mixed a day in advance of feeding, in about the following proportions: Four bushels mixed cut hay and chaff, 5 bushels silage, and 3 bushels pulped roots. Of this mixture they receive what they will eat up clean three times a day. Cows suckling calves receive, in addition, a light meal ration, from 3 to 5 pounds, according as we deem advisable, though the quantities named do not necessarily represent cast-iron limits. Dry cows receive no meal. The meal mixture consists of 2 parts chopped oats to 1 part bran, by measure.

Milch Cows.—These receive the same bulky food and the same meal mixture at present as the beef cows. Cows giving in the neighborhood of 30 lbs. and upwards of milk per day are fed 10 lbs. per day of the meal mixture. Cows further advanced in lactation receive from 5 to 6 lbs. of meal per day.

Fattening Steers.—The steers are fed all they will eat, morning and night, of hay, silage, and root mixture. At noon they are given a light feed (about 6 lbs.) of long hay, by way of variety. Their meal consists of chopped corn and oats in the proportion of 5 parts corn to 4 parts oats, by weight. It is intended to increase considerably the proportion of corn in the mixture as the steers become used to it. In November the steers received about 4 lbs. of meal each per day, and in December 6 lbs. each per day. The quantity of meal will be increased as circumstances seem to demand, the aim being to have the quantity of meal average between one-half and two-thirds of a pound of meal per day for every hundred pounds of the average live weight of the animals. This method has given the most economical gains in our experiments with steers, a report which appears in Bulletin 110, published recently. The meal is fed by measure, but all grain is weighed in bulk before feeding, so that we shall know exactly how much meal the steer consumes during the fattening period. The same is true of the other classes of stock also.

Bulls.—Our stock bulls are fed hay, turnips, and a light meal ration. On an average they receive about half a bushel of turnips and 3 lbs. of meal each per day, the quantity of meal varying with the condition of the animals or the amount of service they have to perform. We find that a light meal ration and a somewhat limited bulky ration tends to keep the animals active. The meal consists of 4 parts chopped oats to 1 part bran, by measure.

Sheep.—The sheep are fed a mixture of cut hay and pulped turnips twice a day, with a feed of pea straw outside at noon. On an average they receive about 5 lbs. of turnips each per day, but this quantity will be reduced as lambing time approaches. In addition they receive a light meal ration, the quantity varying with the condition of the ewes. At present they average nearly 1 lb. per head per day of a mixture of 2 parts chopped oats to 1 part bran, by measure.

Swine.—In our piggery we have to feed a considerable amount of refuse from the College kitchen, a substance of varying composition and somewhat doubtful value. Our practice has been to cook this refuse, and to a barrel of it add about 70 lbs. of a meal mixture, composed of equal parts, by measure, of chopped barley, bran, and middlings. This mixture is fed to dry sows and hogs that have reached the age of about four months or over. The quantity varies with the condition of the animals, well grown animals usually receiving only two feeds per day, with roots at noon. Sows that are near farrowing or that are suckling pigs are not fed the refuse from the College, their ration consisting of chopped oats, bran and middlings, the oats constituting half the bulk of the ration. A few roots are fed by way of variety. To pigs just weaned we feed skim-milk, when ob-

tainable, with about two parts middlings to one of bran. A few roots are fed every day to accustom the pigs to eating them.

We are contemplating feeding more dry food during the winter months, and will report results at a later date.

Financial Matters.

As the necessary data are not at my disposal, I shall not attempt to give a statement of the financial standing of the farm department this year. The general financial statement of the institution, however, does not represent the farm in its true light, since no account is taken of the produce and labor supplied to other departments. For example, we may mention the hay, silage, roots, pasture, and bull service for the large herd of cows kept in the dairy department; the hay and roots supplied the experimental department; the keep of horses for the garden and College departments; the potatoes and milk supplied to the College; the purchase and keep of extra animals for educational purposes; and a long list of services in the way of labor of men and teams for various departments, for all of which the Farm department does not receive a dollar of credit in the Public Accounts. In addition to the above, there are a few other points to which I desire to call attention.

In the first place, at a meeting of the Advisory Board, held late in September, it was decided not to have an auction sale but to dispose of the surplus stock by ordinary sale, as the amount available was hardly sufficient to warrant the extra expense necessary for an auction sale. This left us over-stocked with hogs which were disposed of as best we could in order to reduce our herd to the capacity of our winter quarters. A considerable amount of stock remains unsold at the time of writing this report. This statement of facts accounts for the very considerable shortage in the estimated revenue from the farm.

In the second place, I beg to state most emphatically that under existing conditions, it is impossible to make the farm show a satisfactory profit. It is true that by requiring all departments to pay the Farm department for everything received therefrom, the same as if purchased or hired from an outsider, the annual deficit shown in the public accounts could be greatly reduced. In order to make the farm show a profit, it would be necessary to set a portion of it apart, equip it with separate buildings, stock and implements, allow no other department to interfere with it, and have its accounts kept entirely separate from all others. But if this were done in accordance with the demands of some critics, and a profit shown from the land thus set apart, of what value would this be to the farmers of the Province? It would merely be demonstrating what is already being demonstrated on many well managed farms in this Province, that it is possible to make a profit from farming by pursuing a certain course. We find men making money out of dairying, out of fattening animals for market, out of breeding pure-bred stock of various kinds, and other lines of farming, as well as from all sorts of combinations of the lines mentioned. Now, who is to decide, or how is it to be decided what particular line or combination of lines of farming is to be adopted for this proposed model farm? Since it is a provincial institution, it is evident that any system which might be adopted must be applicable to the Province as a whole. There could be no excuse for following methods which, from their nature, would be incapable of general adoption. Is dairying to be followed? Then what about those whose taste, location, or investment of capital renders dairying out of the question? And would it be an unmixed good if all the farmers in the Province engaged in dairying? Are cattle to be purchased for feeding, and possibly grain purchased to feed them? Then who is to raise these cattle and grow the grain? Let everyone who has a plan to propose, apply it to the touchstone of general applicability, and see whether at best it would not only be a scheme to benefit a few at the expense of many.

There is still another side to this question. Select any successful farmer, and then vist his less successful neighbors and ask them why they do not adopt his methods, and you will probably receive such answers as these: "I have not the capital;" "I have not the business ability;" "I have no taste for that kind of farming, and would not engage in it;" "I have not the same natural advantages;" "I have not the reputation," etc. Now, if our model farm were in operation, we should hear another reason: "I have not

the Government at my back." Those who advocate a model farm to demonstrate how to make money, are exceedingly vague regarding the details of the scheme; and unless the scheme can be shown to be applicable to a great majority of the farms in the Province, what justification can there be for launching upon the enterprise?

People overlook the fact that science is applicable to all branches or lines of agriculture. It is as much for the day laborer working after hours in his small potato patch, as it is for the largest land owner in the Province. With this in mind, as well as the fact that a uniform system of farming throughout the Province is unattainable, if not undesirable, we are forced to the conclusion that if our College farm is to be of the greatest value to the Province as a whole, it must illustrate the application of advanced methods to as many phases of farm work as practicable. But this broadening of operations is a source of weakness financially, because no farmer could hope to make money if he divided his operations into as many channels as we are forced to do here. On the other hand, if the scope of our work were narrowed down to meet the requirements of a money-making concern, the number of people who could derive benefit from our operations would necessarily be very small. Take for example our students, to whom I believe we owe our first duty on account of the expense they are incurring to avail themselves of what we have to teach. It is argued that no better object lesson could be given them than a farm run upon a paying basis. Possibly this is true, provided that a system of farming were followed that each student could put into practice upon his return home. But, as a matter of fact, there is a very wide variation in the requirements of our students, and our present efforts are directed towards giving each man something that will be of use to him in his particular line. According to the proposed plan of having a farm run on some special line, probably not one-tenth of our students would find it possible to adopt a similar line of farming, and the remainder would leave here without receiving any real help towards solving the problems which they have to encounter on their own farms.

I have dwelt upon the above points somewhat at length, because I know that in taking upon myself the responsibility of conducting the Farm Department, I am assuming control of perhaps the most imperfectly understood and the most unfairly criticised department in connection with the institution. I think it important, therefore, that at the very commencement of my duties, I should make an effort to explain what appears to me the proper functions of the Farm Department, in opposition to proposals which are made from time to time regarding it. I may add that I have no hope of making the farm show a profit so long as present conditions exist. I shall endeavor to conduct the department with as much economy as is consistent with its efficiency, and an effort will be made to have the various operations of the farm represent advanced methods, so that our students, or others who are interested, may derive therefrom some hints which will be of service to them in directing the operations of their own farms.

Trusting that this defence of the Farm Department as it exists at present may not be regarded as out of place,

I have the honor to be,
Your obedient servant,
G. E. DAY.
Professor of Agriculture.

Ontario Agricultural College,
Guelph, December 30th, 1899.

PART IX.

PROFESSOR OF HORTICULTURE.

To the President of the Ontario Agricultural College :

Sir,—I have the honor to submit herewith my seventh annual report. In accordance with your request, it has been very much condensed and all tabular results of experiments have been excluded. These we hope to be able to publish in bulletins which will be prepared from time to time as sufficient valuable data are accumulated. The present report, therefore, is merely a brief summary of the work carried on in this department during the past year.

Teaching.—A full course of lectures, as outlined in the College circular, was given to the students of the first, second, and third years; and the studies taken up in lectures were supplemented by demonstration and practical work in the orchard, vineyard, small-fruit plantation, garden, greenhouse, and laboratory.

Outside Work.—The regular work of this department, apart from that of teaching, is of a varied character, and includes the care and management of : 1, Orchards ; 2, Vineyard ; 3, Small-fruit plantations ; 4, Vegetable garden ; 5, Lawn and grounds ; 6, Forestry plantations ; 7, Conservatory and greenhouses. In each of these much work has been done, and considerable progress has been made during the year. We shall refer briefly to such features of the work as may be of the most interest to the general public.

The Orchard.

In the young orchard, set out in the spring of 1897, we have a large collection of varieties of apples, pears, plums, and cherries. And we are pleased to report that all of these, even the Japan plums—Burbank and Abundance—have so far come through the winters uninjured. In the spring of 1898, twenty trees each of quinces, peaches, and dwarf pears were set out. These were given a slight protection by wrapping them with straw. Some of the quinces and peaches were more or less killed back at the tops, while others and all of the dwarf pears came through uninjured. This was to us an agreeable surprise, when we took into account the severity of the past winter, which is generally considered the most disastrous that Ontario fruit-growers have yet experienced. There was little or no snow to protect the ground all winter, while the mercury often ranged from 15 to 30 degrees below zero for several days at a time. The ground in many places was frozen to a depth of from five to six feet. That such trees managed to survive with us, while thousands were killed out, root and branch, in the best fruit sections, is more than we could have expected.

The Vineyard.

In the young vineyard, set out in the spring of 1898, we were not so fortunate, as nearly 35 per cent. of the vines were winter killed. The varieties planted in this vineyard were selected from amongst the earliest and most likely to mature their fruit in this section. A count of the survivors this year shows that there is evidently a marked difference in the hardiness of the different varieties. We had about thirty-five vines of each of the following varieties. The list gives them in the order of hardiness, and shows the extent to which each suffered from winter killing :

	Per cent.			Per cent.	
1. Moore's Diamond.	2.6	winter killed.	8. Early Victor....	34.7	winter killed
2. Worden	5.3	"	9. Moyer	42.1	"
3. Early Ohio.....	7.8	"	10. Lindley	47.3	"
4. Wyoming Red . .	7.8	"	11. Massasoit	47.3	"
5. Moore's Early....	10.5	"	12. Delaware	68.4	"
6. Jessica.....	13.1	"	13. Green Mountain.	70.9	"
7. Brighton	34.2	"	14. Hartford 100.0		"

Raspberries.

During the past three years we have been fruiting thirty-three varieties of raspberries, and careful records have been made of the yields from each variety. Among the reds, Columbian (purple), Shaffer (purple), and Cuthbert rank in the order mentioned for the heaviest yields during the past season. Highland Hardy and Marlboro rank first for earliness, giving the largest yields before the 15th of July. Golden Queen and London gave the largest late yields. These few varieties, including early, medium, and late, as well as those of red, purple, and golden color, would make a choice collection for either home use or market.

Among the black raspberries, Older, Gault, Eureka, and Hilborn, come in the order named for total weight of crop. Eureka holds the record for earliness, having given the largest yield before the 15th of July; while Mammoth Cluster and Gault made the largest late yields. The Palmer, which in 1897 held first place for total yield, dropped this year to sixth place on the list; and Gregg, which last year came third on the list, now stands tenth.

A new plantation of raspberries was set out last spring, containing about sixty varieties. And notwithstanding the exceedingly severe drouth of last summer the bushes have made remarkably fine growth. All of these varieties will in due time be thoroughly tested and reported upon.

Blackberries.

It has generally been considered that blackberries were too tender for sections of the country having a climate such as we have at Guelph. But after an experience of three years, including such a severe test as our bushes had last winter, we think we may safely say we have found some varieties which may be considered hardy, even at Guelph.

Eight varieties have now been fruited here, and among them Agawam, Western Triumph, and Stone's Hardy have so far come through the winters uninjured; and this year they rank in the order named for total weight of crop. Gainor, Ancient Briton, Taylor and even Snyder were more or less seriously winter-killed, and yielded in the order mentioned.

Currants.

Currants are among the hardiest of our small fruits; and, with reasonable care, they may be expected to yield a good crop in all sections, and all seasons. As with other fruits, however, there is considerable difference in the productiveness of the different varieties. During the past three years we have been fruiting thirteen varieties, two white, eight red and three black. In all these years, the *White Grape* has held first place as a white currant, and until last year it had not been beaten in point of yield by any other variety, either red or black.

For first place among the red varieties there has been a number of strong competitors. In 1897 that place was held by Raby Castle, which this year stands fifth on the list. In 1898 it was held by North Star, which this year has dropped to seventh place. And in 1899 Fay's Prolific stands first, with an average yield of 54 oz. per bush, while Cherry follows with an average yield of 39 oz. per bush. But as *Fay's Prolific and Cherry* bear much larger and finer looking fruit than any of the others mentioned, they have an additional claim to consideration by the planter. Belle de St. Giles, a new variety which this year ranks fourth on our list for productiveness, also bears very large, handsome fruit, and is well worthy of trial.

For an average of the yields of the past three years, the *Champion* ranks first among the black currants; but it has not, on the whole, very much outyielded Naples and Lee's Prolific. And none of the blacks have borne anything like the crops given by the best red and white varieties.

Gooseberries.

There are two quite distinct classes of gooseberries grown in this country—*the American varieties*, which have been developed from the native wild gooseberries, and *the European varieties*, the plants of which are mostly imported from England. The American varieties are, as a rule, better suited to our climate, are more healthy and vigorous, and bear more heavily, although the fruit is not so large as that of the English varieties. The

great trouble with the English varieties, in this country, is that they are so subject to mildew that it is seldom we can get a good crop from them, unless they have been regularly and thoroughly sprayed with potassium sulphide.

During the past three years we have fruited thirteen of the varieties most commonly sold by Canadian nurserymen. Six of them were American varieties, and seven were English ; and all of the former have each year yielded better than the latter. For each of the three years *Pearl* has headed the list in productiveness. The contest for second place has been between Downing, Red Jacket and Houghton, each of which have held this place for one year. Downing very closely resembles Pearl in appearance, but has never yet come quite up to it in productiveness.

Red Jacket is one of the most promising of the American varieties ; and although it is of English parentage, it has not yet shown signs of mildew, the berries being quite as large as some of the leading English varieties.

Strawberries.

Two hundred and fifty varieties of strawberries have been fruited here during the past four years. Careful notes have been taken on the habit of plant, and the character of fruit of each variety, and every picking has been carefully weighed and recorded. We are in a position, therefore, to speak with some authority upon a large number of varieties, and particularly upon those that have been under test for four years in succession. It is impossible, however, to give a satisfactory report in such a brief summary as is here necessary, because of the many and varied qualities which have to be considered in arriving at a conclusion as to what is really the best early, medium and late strawberry. We hope soon to be able to prepare a bulletin on this subject in which a fuller report can be be given. Only a few of the leading varieties can be here mentioned. Among two hundred and seventeen varieties fruited this year, *Irene* heads the list for productiveness, while Stone's Early comes second, and Clyde third.

Irene is a comparatively new variety, which has been fruited here only two seasons. The plant is vigorous and healthy, and makes plenty of runners. The blossoms are pistillate ; and the fruit begins to ripen about mid-season, and holds on well till late. The berries are of fairly good size, firm, shapely, and of a beautiful rich dark crimson color, with bright yellow seeds, and a varnished appearance. Irene is certainly one of the promising new varieties.

Stone's Early has been tested for the past four years, and during that time it has made the highest average for total weight of crop. It is something of the Haverland type, both in plant and berry, having all the excellent qualities of that reliable variety, but it also lacks the firmness necessary for a good shipper.

Clyde is one of the most promising of recent introductions, and has made a grand record for the two years it has been fruited here. The plant is vigorous and healthy, the flower perfect, and the berry is large and moderately firm, but the color is hardly so dark as we would like.

Saunders ranks second for productiveness among the varieties which have been tested for four years. It possesses as many of the good qualities and as few of the faults as any variety on the list. The plant is vigorous, free from rust, makes plenty of runners, has perfect blossoms, blooms late, and thus often escapes injury from late spring frosts. The berry is large, firm, well shaped, and of a good color. As an all-round late variety, Saunders has proved one of the best.

As to which is *the best early variety*, it is more difficult to decide, as there have been a number of strong contestants for that honor. For two years in succession Van Deman held first place for the largest early yield, but in the drouth of last summer it fell far behind several others. But as far as earliness and fine berries are concerned Van Deman is hard to beat, its worst fault is that the plant lacks vigor, and thus requires a favorable season to make a good yield.

Anna Kennedy gave the heaviest yearly yield this year, and is altogether a very handsome, promising variety, but we have not tested it long enough to know how it will hold out. If we were asked to make *a selection of half a dozen* of the leading varieties which would pretty well cover the season, we would from our present experience select Van Deman for earliness, Saunders for lateness, and Stone's Early, Irene, Clyde, and Tennessee Prolific for general crop.

Tomatoes.

In view of the growing importance of the tomato crop, not only for home use but for canning and export, we have for the past two years been conducting a variety test of tomatoes. This year thirty-seven varieties were included in the tests. Careful notes were made on all the important characteristics of each variety, and at each picking accurate records were made of the weight of sound ripe fruit, the rotten fruit, and of the green fruit left on the vines at the end of the season. In this way some very interesting and valuable data were obtained.

In the amount of unripe fruit at the end of the season, there was comparatively little difference in the different varieties ; the lowest having an average of 1 lb. per plant, and the highest having only 2 lbs, 7 ozs. per plant. In the amount of rotted fruit there was a wide range ; varieties such as Atlantic Prize, Aristocrat, Earliest of All, Dwarf Champion, and Early Ruby were comparatively free from rot, while a number of otherwise excellent varieties lost the greater part of their crop in this way. This might have been prevented to a large extent by spraying with the Bordeaux mixture, but they were left unsprayed in order to ascertain the susceptibility of each variety to the tomato rot fungus ; and the results show that there is a very marked difference in this respect.

Taking into account the amount of sound ripe fruit for the whole season, we fine a wonderful difference in the productiveness of the various varieties. *Atlantic Prize*, stands at the head of the list, with an average yield of 77 lbs. 10 ozs. per plant, while the so-called " Best of All " stands at the bottom of the list, with an average yield of only 8 lbs. 7 ozs. per plant. The first dozen varieties in the order of their yields of sound ripe fruit were Atlantic Prize, Earliest of All, Stone, Mayflower, Aristocrat, Ponderosa, Ignotum, Livingstone's Beauty, Long Keeper, Trophy, Fordhook First, and Dwarf Champion.

In this year's as well as in last year's tests the first variety to give ripe fruit was *Earliest of All* (Steele-Brigg's). This variety has made for itself a good record, being not only very early but very productive. The fruit is of good size and color, but lacks somewhat in smoothness and firmness.

Atlantic Prize, may be considered one of the standards for earliness, and it is only a few days later than Earliest of All, while the fruit is smoother and firmer. In sections such as this, where the seasons are short, these early varieties have proved to be the most satisfactory for main crop.

For handsome, smooth, firm, well-colored fruit, *Stone* and *Aristocrat* were two of the best. The former was about a week later than the Earliest of All, and ranks third on the list for productiveness, with an average yield of 46 lbs. 10 ozs. per plant, although it lost 12 lbs. per plant by rot. Aristocrat was about two weeks later than Stone, and ranks fifth for productiveness, with an average yield of 38 lbs. per plant, and was free from rot.

Tests of Ornamentals.

Floriculture is a branch of horticulture to which more and more attention is being given as our country becomes older. Some evidence of this may be seen in the greater attention being given to annual flower shows, and the increased space devoted each year to ornamentals in the catalogues of seedsmen and nurserymen. From the glowing and two often exaggerated descriptions given in many of these catalogues, the novice is often altogether at a loss to know which really are the most satisfactory species or variety. Of course these are questions about which there may be a great variety of opinions, nevertheless the difficulty of selection would be considerably lessened, if these lengthy lists of varities could be reduced to say a score or two of the choicest.

For some time past we have been testing a great many varieties of a number of the most popular species of ornamentals, and a few of what we have found to be the most satisfactory are here given.

Geraniums.—For several years past, we have been testing a large number of varieties of geraniums for bedding purposes ; and for the past two seasons, careful notes have been taken on 230 varieties, which have been grown under the same conditions in the green house and have been tested side by side in the flower border. This collection is

made up from stock secured from some of the leading growers on this continent. In the list given below only those varieties are mentioned which have scored the highest number of points for two years in succession :

Scarlet—Aceton, Director Marmy, Garden Director, General Grant, J. J. Harrison, Louis Fages, Marvel, M. A. Bouleaus, Marquis de Garland and W. A. Chalfant. *Crimson*—S. A. Nutt. *Rose*—Fanny Thorpe and La Constable. *Pink*—Eulalie, Madonna and Mary Hill. *Salmon*—Dr. Verneuil, John Good and Mrs. E. G. Hill. *White*—Alpine Beauty, C. de Harcourt, La Favorite and Mad. Buchner. *Silver-leaved*—Mad. Salerol and Mrs. Parker. *Golden-leaved*—Crystal Palace Gem.

Coleuses.—Probably none of the many plants used for bedding purposes make a greater color display of foliage than the coleus. To attempt to describe the coloring and markings in some of the varieties now grown would seem like presumption, yet, in addition to rich coloring a first-class bedding variety must have vigor and a free branching habit. During the past two years forty-five varieties have been tested side by side in our trial plots ; and while the colors have not been lost sight of, careful note has been taken of the vigor and habit of each variety. The following have been found to combine the greatest number of desirable qualities : Alhambra, Beckwith Gem, Chicago Bedder, Charming, Excelsior, Electric Light, Firecress, Firebrand, Golden Bedder, John Good, Pink Gem, Paroquet and Rob Roy.

Chrysanthemums.—The chrysanthemum deservedly enjoys the distinction of being the " Queen of Autumn Flowers." It is a favorite not only with the professional, who grows it in all its perfection for the autumn shows, but with the amateur who delights in having bright and cheery flowers in the house at the Thanksgiving season.

To encourage its cultivation to a greater extent in the homes of the people, a commendable move was made last year by some of the local horticultural societies of the Province. In the spring, small collections of desirable varieties were given to the members ; and when the flowers were in bloom in the autumn, little chrysanthemum shows were held, when the beauties of the flowers were discussed and admired.

In order to assist any such societies as may make a similar effort next year, we give below a list, which may be considered the cream of about 250 varieties which we have tested for several years. This list includes not only representatives of most of the different types, but also a wide range of shades and colors.

Japanese—Autumn Glow, Georgina Pitcher, Harry Sunderbruch, Heron's Plume, Maud Dean, Mrs. W. H. Robinson, Mrs. L. Allan, O. P. Basset, Philadelphia, Pitcher and Manda, Queen, Viviand-Morels W. H. Lincoln and Waban. *Japanese Quilled*—Good Gracious, Helen Bloodgood, Iora, Kentucky, L. B. Bird and Mrs. W. H. Rand. *Japanese Hairy*—Beauty of Truro, Louis Boehmer, Leocadie Gentils, Mrs. Alpheus Hardy and R. M. Grey. *Chinese*—Cupid, Ideality, Mrs. L. C. Maderia, Mrs. Col. Goodman and Major Bonnaffon. *Anemone-flowered*—Antonius, Condor, Descartes, Falcion, John Bunyan, Madame Robt. Owen and Surprise. *Pompons*—Rose Travena, Golden Fleece and Black Douglas. *Single-flowered*—Eucharis and Framfield Beauty.

Gladioli.—The gladiolus is one of the summer bloomers deserving of much more general cultivation. It is so easily grown that anyone who can plant the corms in the spring may reap a rich reward in bloom during the latter part of the summer. The flowers present a wonderful variety of colors and markings, and are often quite as choice as the rich man's orchid. If the spikes are cut and put in water in the house, when the first few lower flowers open, the upper flowers will open in succession, and often last for a week. A collection of mixed unnamed varieties will often give lots of bloom and good satisfaction ; but if something choice is wanted, there is much more satisfaction with a good collection of named varieties. A large number have been grown here during the past three years, and in the following list we give a score of those that have been most admired. This list includes good representatives of the Gandavensis, Lemoinei, Nanceianus, and Childsi types, and should give a succession of bloom from the middle of July to the end of October ; Achanti, Diamant, Deuil de Carnot, Domino Rose, Dr. Bailly, Erie, E. V. Hallock, E. Souchet, Formosa, La Parisienne, La Perle, Massena, Magenta, M. de Vilmorin, Nakomis, Nezinscott, Pacha, P. Hariot, Princeton and Snow-white.

Ontario Fruits for the Paris Exposition.

During the summer this department had charge of the preparation of a collection of Ontario fruits for display at the Paris Exposition. This work began with the small fruits early in July, and continued until the last of the winter apples were received about the end of the year. Excellent samples of different kinds of fruits were received from all sections of the country, and after careful selections the best were put up in glass jars, in preservative fluids best suited to retain the natural color of the different fruits.

The collection when completed made a very fine display, and, if it reaches Paris in good condition, it should be a credit to the fruit industry of this Province. On each jar was placed a neat label, giving the name of the variety of fruit, and also the name and address of the grower. After a good deal of culling and selecting of the best, the collection as put up for shipment consisted of 613 jars, made up as follows: 139 jars of apples, 84 of pears, 30 of peaches, 93 of plums, 5 of quinces, 2 of apricots, 54 of grapes, 80 of raspberries, 14 of blackberries, 34 of gooseberries, 39 of currants, and 39 of cherries.

Acknowledgments.

I beg to acknowledge with thanks the following donations to this department during the past year:

Roderick Cameron, Niagara Falls, Ont.—Some choice species of greenhouse plants.

Central Experimental Farm, Ottawa, Ont.—Collection of American plums, raspberries, strawberries and tricolor geraniums.

Robt. Marshall, Snelgrove, Ont.—Scions of Dutch Mignonne apple.

Chas. T. Ford, Stoke Canon, England.—Scions of Cornish Gilliflower.

E. Routledge, Clinton, Ont.—Plants or Ocean Wave and Lancashire Lad gooseberries.

S. O. Sunley, Guelph, Ont.—Plants of seedling strawberries.

Spramotor Co, London, Ont.—Spray pump.

A. E. Sherrington, Walkerton, Ont.—Plants of Superlative raspberry.

G. O. Caston, Craighurst, Ont.—Plants of Little's 44 strawberry.

A. H. Crosby, Markham, Ont.—Plants of seedling gooseberry.

E. Bromley, Barkerville, B. C.—Plants of B. C. blueberries.

Henry Gowling, Wandin Yallock, Victoria, Australia.—Strawberry plants.

S. Greenfield, Ottawa, Ont.—Cuttings of seedling currant.

S. Spillett, Nantyr, Ont.—Gooseberry plants.

My thanks are also due to the heads of other departments, who have rendered kindly assistance in various ways, and to the foremen and men of this department, who have faithfully contributed their share towards making the work of the year a success.

Respectfully submitted,

Ontario Agricultural College,
Guelph, Dec. 30, 1899.

H. L. HUTT.
Professor of Horticulture.

PART X.

BACTERIOLOGICAL DEPARTMENT.

To the President of the Ontario Agricultural College:

SIR,—In the absence of the Professor of Bacteriology, I venture to submit a brief report of some of the work done in the Department during 1899.

ROUP IN FOWL.

A considerable amount of work has been done in investigating the diseases known as roup, canker and distemper in fowls. Attacks of roup cause much loss and annoyance to poultry raisers, and it is seldom that one sees a number of any poultry journal which does not contain one or more inquiries about a cure for roup.

In the spring, several letters were sent by me to various poultrymen in Canada and to a few in the United States, in order to find out definitely the opinions of practical men on the subject. The results, however, were most disapppointing. Only two Canadian poultrymen answered the questions, but all letters sent to the Americans were most fully answered, and the writers requested that they might be furnished with any information obtained as a result of our work.

I may also say that I found it almost impossible to obtain diseased birds from poultrymen. In several cases known to me, birds have died from the disease or have been killed and buried; but I have not been able to obtain any information from the owners. They have simply expressed the hope that we would soon find some reliable remedy. It has, as a rule, been necessary to pay for diseased birds, even when they appeared to be almost dead. I must, however, thank Mr. Graham, the poultry manager at the College, for his assistance in obtaining roupy birds.

Roup is probably the most widely spread and destructive disease affecting domestic fowls. Hens, chickens, turkeys, pigeons and pheasants are affected. In some outbreaks the mortality is high; in others, there are no deaths.

Opinions differ as to the cause of roup, but by most poultrymen it is supposed to be due to exposure to draughts or cold. It is generally admitted that the disease is infectious, and, this being the case, we must look for some more substantial cause for it than draughts or cold; for we know that infectious diseases, both in animals and man, are the result of the growth of either vegetable or animal parasites in the body. Roup has been ascribed to the growth of various organisms, both animal and vegetable; in fact, it has been stated that there are three organisms which cause the symptoms usually found in connection with roup.

In my investigations I have discovered as yet only one organism which will produce a membrane in the throat of fowls similar to what is found in cases of roup. This is described in the paragraph at the end of this article. Another organism, a coccidium, has been found to be present in the tissues of diseased birds, but I cannot yet show that it is the cause of the disease, although certain writers have stated that some forms of roup are caused by a coccidium. Further investigation will no doubt throw more light upon the subject, and it is hoped that sufficient valuable material may be obtained to allow of the publication of a bulletin on the diseases of poultry.

My attention was directed to an article by H. A. Stevenson, M.D, published in the *Journal of Comparative Medicine*, July, 1898, in which he states that roup is "caused by a specific germ which appears to me to be identical with the Klebs-Löffler bacillus"; and again, "I believe roup and canker to be the same disease, a disease identical with diphtheria in man."

Now these statements, if borne out by experiment and found to be correct, would demand the most rigorous treatment of diseased birds; in fact, the disease would soon

occupy a place of importance as high as that now accorded to bovine tuberculosis; for Dr. Stevenson takes the position that diphtheria may be spread by roupy birds in exactly the same manner as tuberculosis is supposed to be spread by tuberculous cattle. But several questions occur. In the first place, does our experience of the occurrence of roup in fowls and diphtheria in the human being lead us to the conclusion that there is a probability of there being any connection between the two diseases? Is not diphtheria a disease which is more prevalent in towns and closely populated districts, where very few fowls are kept? Is not roup at certain seasons almost universally prevalent in some poultry yards in the country, where there may be hundreds of cases of the disease without a single case of diptheria among those who look after the birds and treat them from day to day? Has it ever been observed that poultry raisers are more frequently attacked with diphtheria than those who keep aloof from poultry yards?

I may say, in a word, that I have not been able to obtain any evidence in support of Dr. Stevenson's contention.

Statements have been made by European writers that outbreaks of diphtheria have been found to occur in men, while at the same time poultry kept in the buildings in which the men lived were suffering from roup. They, however, do not note whether the roup commenced before the diphtheria or *vice versa*; and they give no good reasons for supposing that the outbreaks were actually connected with each other. In fact it is stated that the cases referred to, of alleged transmission of chicken diphtheritis to man, are on examination found to be mere assumption—due to utter ignorance of veterinary pathology.

Although the writer of the article in the journal referred to has stated that he has isolated a bacillus identical with the Klebs-Loffler (diphtheria) bacillus, yet Loffler himself, n studying the disease, has not mentioned the presence of the bacillus, but describes a totally different organism as the supposed cause of roup.

More recent investigations[2] have failed to reveal the presence of the diphtheria bacillus, as also have those of J. Barlow, Rhode Island Report for 1898.

My own investigations have also failed to confirm Stevenson's statement. In fact it may be said that they have proved the absence of the diphtheria bacillus in a virulent form in the roupy membranes examined, and no organism was found which could be imagined to correspond in appearance or action with that of *bacillus diphtheriæ*. Inoculation experiments with pieces of fresh membrane practised on both guinea pigs and rabbits have given negative results, which could not have been the case had the diphtheria bacillus been present in a sufficiently virulent form to cause the growth of a membrane. Again, sections of the membrane and underlying tissue, although numbers have been made, not only show that the characteristic clumps of Klebs-Löffler bacilli are absent, but that the structure of the membrane differs entirely from that of the diphtheritic membrane formed in the human throat.

Stevenson states that, in his experiments, when rabbits were fed from the same vessel as a roupy bird, they became infected with the disease and died as the result; but experiments conducted here have entirely failed to corroborate this statement. Not only did rabbits live for weeks in coups with roupy birds without becoming affected, but a doe brought up a litter in a coop in which were kept the worst cases of roup procurable; and these rabbits, though drinking from a vessel used by roupy birds, which was uncleaned for weeks, and eating hay and roots which were in constant contact with the birds, never showed any symptoms of ill health.

That there is sometimes a germ resembling the Klebs-Löffler bacillus in birds, I admit, for I have obtained it in numbers from the throats of pigeons which were perfectly healthy before examination, and remained so afterwards.

A similar germ has been isolated from pigeons by Macfadyen and Hewlett (Brit. Med. Journal, p. 1357, 1899), who found them in large numbers in the throats of pigeons suffering from canker. They, however, demonstrated that the disease cannot be produced in healthy birds by inoculation with pure cultures of this germ, and have shown that it has no toxic effect upon mice and guinea pigs, such as that produced by inoculation with *bacillus diphtheriæ*. They, therefore, conclude that it is not the same organism.

1. Triedberger and Frohner, Vet. Path., p. 233. 2. Infectious Diseases of Poultry by V. A. Moore, Bureau of Animal Industry, Bulletin No. 8, Washington, 1895.

There is at present no evidence to show that roup is caused by the Klebs-Loffler bacillus. On the contrary, there is a considerable amount of evidence which tends to show that it is not. In fact it has not yet been shown conclusively that the disease is due to the presence of any bacillus whatever.

It is clearly stated by Friedberger and Frohner that there are at least three varieties of organisms causing diphtheritic or roupy symptoms in fowls, two of these being of animal origin, and the third surmised to be a germ, although no evidence other than the infectious nature of the disease bears out this supposition.

The widely varying symptoms of roup are, no doubt, responsible for the various names by which the different forms are known, and for the difference of opinion as to what constitutes roup and what canker, and whether distemper develops into canker, as if generally supposed to be the case, or whether they are entirely distinct diseases; and it is only by careful and sympathetic observations, which may extend over years, that the real facts can be ascertained.

Antidiphtheric Serum as a Cure for Roup.—I was requested to make some tests as to the value of diphtheria antitoxin as a remedy and preventive agent for roup, as advocated in Dr. Stevenson's article already mentioned.

The use of this serum has been suggested by certain investigators in Europe; but I am unable to find any accounts of its use there.

Different lots of serum were obtained from well-known and reliable firms, and there can be no doubt as to its antitoxic properties when used in cases of genuine diphtheria.

The birds experimented on all presented the characteristic symptoms of roup, as given by Dr. Stevenson, and, therefore, I infer that I worked with birds suffering from the same affection as were those he used, and which it seems were invariably cured by the injection of the serum. The dosage and method of injection, as advised, were closely followed, with, however, very different results.

In only one hen was there a recovery closely following the injection, and it is extremely doubtful whether this was due to the action of the serum or to the care given to the bird; because in all cases the birds had contracted the disease while kept in buildings so cold that some of them had their combs frozen. While being experimented with, they were kept in a room warmed with steam pipes, and received the best possible attention, which was frequently sufficient to bring about a rapid recovery without any treatment. Even if the serum treatment were successful, the expense would prohibit its use, except in the case of valuable birds.

The action of any serum depends upon the fact that it contains substances, elaborated in the body of the animal from which it is derived, which are antagonistic to the products of the disease germ against which it is used. Hence the application of antidiphtheric serum would naturally give favorabe results in roup if that disease were caused by the diphtheria germ, which I have already shown is not the case; and I may add that in testing the serum, attempts have, on several occasions, been made to infect hens with the diphtheria bacillus, but without success.

The serum was also tried as a preventive. Healthy birds were injected and placed with diseased birds, and almost invariably they contracted the disease. Those that did did not do so could not be considered to have been immunised by the injection, because they had for some time previously been exposed with infected birds without becoming diseased. I have found that birds may remain healthy when exposed to the disease for several weeks, or even months, and then suddenly show the characteristic membranes in the throat, with no other injurious symptoms, and continue to lay eggs or gain in weight as usual.

Aspergilliosis in Fowls.

During my work on roup, I obtained several birds said to be suffering from that disease, but which on examination proved to be affected with *Mycosis* or *Aspergilliosis*. That this is a common and little understood disease can be seen by reference to the inquiry columns of the various poultry journals, in which diseases are frequently described that have all the symptoms of Mycosis.

The symptoms are much the same as those of some forms of roup, and the two diseases may be concurrent. There is usually a wheezing and rattling in the throat, with elevated temperature; and patches of membrane appear in the mouth and throat

The birds become thin and weak, the breath having in many cases a most offensive odor; and death usually ensues; but I believe birds do recover, and I have known some to be affected for over a year, remaining to all outward appearance in good health, and at length die suddenly from suffocation.

On post mortem examination, the air sacks of the thorax, and in some bad cases in the other portions of the body, are found to contain a hard, cheesy mass, which in some instances has an exceedingly foul odor. In advanced stages the lungs may be affected and exhibit numerous dark patches containg a viscid semi-purulent substance, while the other organs are healthy. Membranes or exudations may be present in the mouth and throat and also in portions of the intestines.

Cause.—This disease is caused by the growth in the tissues of different varieties of Aspergilli, which are species of mould. The Mycelia of the mould penetrate in all directions through the tissues, causing irritation and an exudation of blood cells, which, with the dead tissue cells and the mycelia of the fungus, form the cheesy mass already mentioned; and these in many cases cause suffocation by pressure on the air vessels.

Prevention and Cure.—As the disease is spread by means of spores, of which there are two kinds, the only method of prevention is by getting rid of the spores; but as these fungi are able to grow and produce spores on dead organic matter, it is practically impossible to do this. It must, however, be remembered that diseased birds are themselves scattering the spores freely while alive. One case examined showed the fungus in the spore stage in large quantities in the mouth. Hence all badly affected birds should be immediately killed. No remedy is known; but it has been recommended to make the birds inhale tar vapor, which is done by putting a piece of red-hot iron into some tar and placing the bird in the vapor.

Starters for Cheese-makers and Butter-makers.

During the past season, commencing in May, pure culture starters have been sent out to various cheese and butter-makers, 58 in all having been asked for—44 for cheese-making and 14 for butter-making; and a large number of letters have been received from those who have used the starters, all reporting favorably as to their value In some establishments, they are now in constant use. In butter-making, it is only by using the same starter for all churnings that the full benefit is obtained, the object being to produce butter of a uniform flavor. As it is now an established fact that the flavor in buttter made from good cream is due to the action of certain species of bacteria, it is evident that if a pure culture is used for a few days and then discarded for a week or more the object is not attained; because, although the butter made from naturally soured cream may, in some instances, be superior to that from cream ripened with a pure culture, it will not be uniform in quality like that from the latter. It is well known that the very delicate flavor of the best butter is not retained for any considerable length of time; and as the market for the greater portion of our creamery butter is so situated that much time must elapse between the date at which it is made and that at which it is consumed, the few packages of good butter from the naturally soured cream will have lost some of their flavor and in all probability have deteriorated owing to the presence of undesirable organisms, while that made with the pure culture will have retained its comparatively good flavor.

Directions for propagation are sent with each starter. Nevertheless, inquiries on a few points have been made by makers, the most frequent being as to the length of time that a starter may be kept without propagation and still retain its good qualities.

Experiments have shown that when properly prepared and kept cool in a refrigerator, the starter will be efficacious even at the end of four months. No doubt, it would keep for a longer period; but it must be understood that the lactic organisms are unable to grow in milk if it contains too much acid. After the acidity has reached a certain point, it seems to weaken the germs. Hence it is found that a larger quantity of an old starter is required to ripen a given quantity of milk than if the starter were fresh. It is not advisable to use an old starter directly; a new one should be propagated from it, in order to allow the bacteria to regain strength and vigor. In regard to the difficulty of keeping the starter over Sunday without danger of deterioration, it may be stated that as the only harm to be expected is the excessive souring of the starter, it should be re-

membered that the souring is caused by the growth of germs, and that as this is influenced by the temperature, the natural course to pursue is to keep the starter can at a slightly lower temperature in all cases in which it has, from any cause, to be left for a couple of days. The starter is at its best when thickening, and before it is completely coagulated.

Another difficulty seems to be in the selection of a suitable milk for a starter. All milk for starters should be pasteurized. That process may be relied upon to destroy all growing organisms ; but it will not affect the spores of other germs which may be present and will commence to grow as soon as the milk is cooled. It has, however, been found that, as a rule, the higher the acidity of the milk the more spores it contains ; and that, on this account, the acidity of the milk may be taken as a guide for its suitability for use as a starter—the lower the acidity the more suitable the milk ; but this must be taken only as a general guide, for it is quite possible to have a badly contaminated milk with a low percentage of acid.

One point to which far too little attention is paid is to the covering of the starter can. I have frequently seen milk left exposed to the air from the time it was heated till long after it had cooled down. In this way pasteurized milk becomes contaminated to an extent which depends upon the length of time it is exposed and the number of organisms present in the air. Mould spores are usually present in considerable numbers in the air around buildings ; and although they are not harmful during the ripening process, they are very objectionable in the butter when it is made up into pound packages to be kept for any length of time. Hence the milk should be covered carefully as soon as it is pasteurized ; it should also be stirred and the temperature taken from time to time. A lid with a hole in it to admit the handle of the stirrer should be procured. If the water in which the can is placed is slowly heated there may be no necessity for stirring, and the lid need be removed only for a few seconds when the temperature is taken.

A few extracts from letters written by cheese and butter-makers who have used the starter are given below :

Cheese. Nov. 23rd.—"I had several for cheese-making and got good results from their use generally, although sometimes I had bad success with some of them. I fancy the fault is in the milk not being what it should be to start with."—J. W. Fotheringham.

Butter. Nov. 21st.—"Enclosed find stamps for another . . . the last gave good satisfaction."—W. Bragg.

Butter. Oct. 18th.—"Some time ago we received a butter starter from you. This has given us very good results ; so good, in fact, that, as it is about used out, we should like to have another one from the same culture."—J. H. G., Ottawa Experimental Farm.

Cheese. Sept. 30th.—"Have been using one of your pure culture starters for cheese for some time and am well pleased with the results."

Butter.—"We got a bottle of starter from you the latter part of May or 1st of June, and have used starter made from it ever since . . . The work you are doing is of great advantage to creameries and cheese factories, and should be made use of by them all."—St. Marys Creamery.

Cheese Curing.

It has been conclusively shown by Russell and Babcock that much of the change occurring in cheese during the process of ripening is due to the action of an unorganized ferment which they call gallactase. At the same time, they admit that the action of bacteria may also have a great influence upon the flavor and quality of the cheese.

It is well known that the temperature at which a cheese is cured affects both the rate of ripening and the quality of the cheese,—cheese cured at high temperatures ripening quickly and possessing a texture inferior to that of cheese cured at a lower temperature. The flavor of the latter is usually superior, and it does not deteriorate nearly so quickly as that of hot-cured cheese.

Bacteriological examinations were made, in order to ascertain what effect the temperature of the curing-room had upon the bacterial content of cheese, and if possible to find out whether differences in bacterial content corresponded with the differences in the ripening cheese, in texture, flavor, etc.

Four batches of cheese were examined, each consisting of three cheese made from the same curd but kept in curing rooms at different temperatures. Samples were taken every three days, but, as a rule, owing to the small size of the cheese, plugs could be taken from only one end of each cheese; and on this account samples could not be obtained for so long a period as was desired, without danger of boring too close to an old hole and so obtaining a sample which might be affected by the presence of moulds.

A well-marked difference in texture and flavor was apparent throughout the examination; and although the scores given by the expert judges do not show a very marked difference in the cheese cured at different temperatures, they cannot be accepted as representing the actual difference between the ripened cheese, because the scores were all made at the same time and obviously cannot be taken as sufficiently accurate for experimental purposes, since the cheese were at very different stages of ripeness. While the hot-cured cheese were perhaps quite ripe, the cooler cured cheese were not nearly ripe; and it is impossible to say what change the latter would have undergone in the period of several weeks required to ripen it equally with the former.

This difficulty is mentioned also by Lloyd in the Bath and West of England Society's Report for 1898-9, and he states that by ascertaining the acidity of the cheese and the soluble solids he was able to give definitely the period at which a cheese would become fully ripe, and beyond which it commenced to deteriorate. This method he has used to find out when the cheese is in the best condition for marketing, and has obtained satisfactory results by so doing. It was not possible, owing to lack of time, in the experiments conducted in this Laboratory to ascertain the soluble solids, but the acidity was found. It was found that there was a distinct instinct in the percentage of acids in the cheese as the ripening process proceeded, but it was not uniform. The amount of acid in the cheese examined showed that when at their maximum of quality they did not contain quite so high a per centage as did the English cheese according to Lloyd's work. Some standard sufficiently accurate for practical work may be found by making a sufficiently large number of acid determinations, and it is intended to continue work in this direction if possible.

The results of the bacteriological examination show that the cheese cured at a low temperature has a far larger bacterial content than one cured at a high temperature; although for a very short period, not extending over two or three days, the hot-cured cheese, often being in the curing room for about 7–10 days, showed a slightly higher bacterial content than the cool cheese. The germs continue to increase in the cool cheese for a very much longer period than in the hot cheese. At a certain period, soon after being placed in the curing room, the high temperature cheese contains for a very short time a slightly higher number of germs than one kept in a cool room.

Another interesting and probably important point, when considered in connection with the above results, is that the cheese made in the latter part of the season have a very much higher germ content than those made in the spring and summer. It is a well known fact that fall cheese are superior to those made earlier in the season; it is also indisputable that cheese cured at low temperatures are of better quality than if cured at high or ordinary temperatures. Now, in both the fall cheese and the cold-cured cheese, we find an enormous increase of bacteria over those made at other times and cured at higher temperatures; and it appears to be quite reasonable to assume that in all probability the improved quality in both cases is due to the action of these bacteria. If this is so, it is a strong point in favor of the addition of a starter. It is hoped that further experiments will throw light on this point.

It is difficult to account for certain of the differences in germ content and quality of the cheese. In three of the series, *p. coli* was present in fair numbers. This germ has always been credited with the production of bad flavor in milk and cheese, and an attempt was made to find out to what extent this was true in the cheese examined. The results in two of the series showed clearly that the number of coli germs in the cool cheese was very much greater than in the high temperature cheese; but at the same time the flavor of the cool cheese was more pleasant than that of the other. This peculiarity may, however, be due to another cause, viz., the action of liquifying bacteria, *i. e.*, bacteria which peptonise and break down the casein. These germs were found to be more numerous and to increase more rapidly in the cheese kept at a high temperature; and as they are found to produce a disagreeable taint in milk, it is probable that they do so in cheese.

Bitter Milk.

During the summer a considerable loss in value of cheese was due to a trouble which was known as "Bitter Milk", and samples of cheese so affected were secured from four factories. The trouble occurred at various times from the latter part of July to well on in September; it was widely spread, and was prevalent in most of the factories of the district.

I had no opportunity to investigate the origin of the trouble nor to determine in what manner it had become so widely spread. The following is a description of the unusual changes met with in such milk, and was given by a maker at one of the affected factories:

"This bitter flavor cannot be detected in either the milk or the curd till acid begins th develop. The acid comes on very rapidly after it starts, and it is almost impossible to get the curd dry enough before matting, and does not altogether leave the curd before salting; but if it is handled properly it does not seem to affect the cheese when cured. At times we will not have any of this flavor for days or weeks, and then for two or three days we will have it quite acid, and all at once it will disappear again."

Other makers evidently have not discovered the "proper way" of treating this bitter curd, for many complained that they were obtaining a lower price for the cheese from such milk.

The first sample was obtained on August 8th. An analysis was made, and milk was inoculated with the various organisms found. Only one of these appeared to cause any undesirable change, and a starter was made by using it with a culture of the lactic acid germ present. Curd made with this starter was said (by a dairyman who had visited the factory) to possess a peculiar flavor. In the College cheese-maker's report, the cheese is said to have an apple flavor, which, of course, refers to the aroma, not to the taste.

The next samples were not received till two months later, but the same organism was isolated and a starter made from it which produced the characteristic peculiarities during the process of cheese-making.

The organism which causes the bitter flavor is a yeast-like form known as the Torula.

Torulas of various species are frequently met with in the air and also in cheese; but, as a rule, their presence does not cause any objectionable flavor.

The Torula isolated from the bitter cheese acts on the milk sugar, setting up a most vigorous and lasting fermentation, the sugar being converted into alcohol and carbon dioxide gas. When fermentation is completed, the milk contains fully as large a percentage of alcohol as the strongest beers; the bitter flavor, however, is noticeable before there is any distinct flavor of alcohol, and in cheese-making the smell of the alcohol does not appear until the curd is almost ready to mill.

It is interesting to note that what O'Callagan describes as a yeast (though he makes no mention of experiments to show whether it is a yeast or a Torula) frequently occurs in cream in New South Wales (New South Wales *Agr. Gazette*, Aug. 1899), giving it a sharp, bitter taste and forming alcohol. He also states that it would be injurious to butter-makers, and still more so to cheese-makers.

The Torula found in the Ontario cheese also produces a vigorous fermentation in other sugars, glucose, dextrose, and cane sugar undergoing this change and producing a clear, fermented liquid.

The source of this Torula, as already stated, has not been ascertained, and its intermittent appearance renders it extremely difficult to offer suggestions as to its exclusion from milk. If there be a reappearance of the trouble next summer, it is to be hoped that opportunity will be given for further investigation.

Experiments made to learn the effect of a lactic acid germ on bitter milk, have shown that the curd in such cases is just as bitter as when no starter is used. Very little gas is formed in either case.

Water Analysis.

Twenty nine samples of water have been examined bacteriologically and reported upon during the past year; and by the two departments, the Chemical and Bacteriological, twenty-seven samples have been analysed in order to ascertain their suitability for domestic and other purposes.

Two samples were sent for examination from cheese factories, in which the makers had experienced much trouble from gassy curd. In one case, a piece of the cheese was sent and on examination was found to contain a gas producing germ, which was present in large numbers in the water. In the second case, the water was also found to contain large numbers of gas-producing germs, but of a different species from that found in the former case. The makers in both factories were informed of the presence of the gas germs in the water and were advised to discontue its use. Both have reported that since doing so, they have had no trouble with gassy curd.

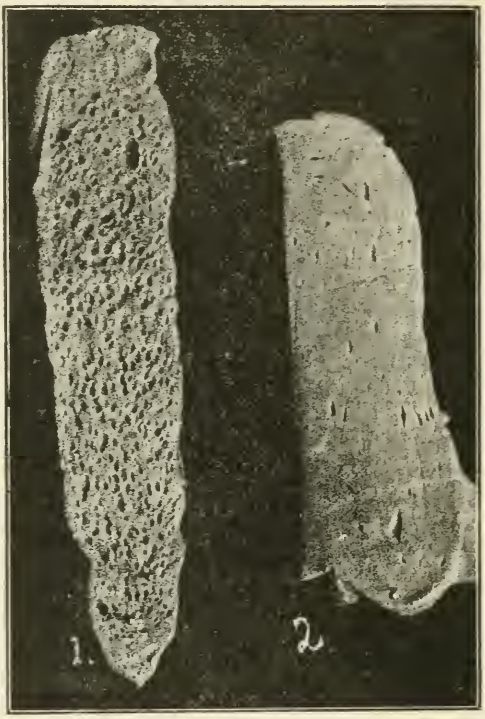


Fig No. 1—Curd made from vat No. 1.
Fig No. 2—Curd made from vat No. 2.

In connection with the second case, some experiments were made to ascertain what effect the addition of a pure culture would have on the progress of the gas formation, and the illustration in connection represents the appearance of pieces of the curd which were made from two vats of milk, numbers 1 and 2. To each of these an equal quantity of the gassy germ was added and at the same time to vat number 2 was added one per cent of a pure culture starter. The effect of this is well illustrated and clearly shows what a powerful influence lactic acid germs (the only germ in the pure culture) have over many undesirable forms found in milk.

Ontario Agricultural College,
Guelph, December 30th, 1899.

MALCOLM N. ROSS,
Fellow in Bacteriology.

[Mr. Ross's report does not deal with the manufacture and distribution of Tuberculin during the year, and is not so complete on one or two other points as he would have made it, had he not, during the time of its preparation, suddenly decided to enlist and start for South Africa.—President.]

PART XI.

EXPERIMENTALIST.

To the President of the Ontario Agricultural College:

SIR,—I have the honor of submitting herewith my report of the work done in the Experimental department during the year 1899. The work of this department during the past year has on the whole been quite satisfactory. The experiments throughout have been conducted with great care and accuracy. We submit the results with much confidence in their reliability and in their real practical value. The writer has good reason to believe that the work of the Experimental department is being appreciated by farmers of the Province, and that the results are being studied more and more each succeeding year:

In 1899, we conducted field experiments on about 2,300 separate plots in our experimental grounds. We also furnished material and instructions for experiments on 21,035 plots situated on 3,485 Ontario farms. For the results of the co-operative experiments, the reader is referred to the Annual Report of the Ontario Agricultural and Experimental Union. The correspondence during the past year has been heavier than ever before. For several weeks in succession we have received upwards of one hundred letters daily. Addresses have been delivered by the writer at the Fourth Annual Meeting of the Agricultural Students' Union at the Ohio University; at the Annual Meeting of the State Board of Agriculture at Columbus, Ohio; at two sessions of the Annual Meeting of the Ontario Agricultural and Experimental Union, and at several meetings of the Farmers' Institutes in the western part of Ontario. About fifty talks of from thirty minutes to two hours were also given in the month of June, when about thirty thousand excursionists visited our experimental grounds. It will, therefore, be seen that the past year has been a very busy one for those connected with the Experimental department.

For several years in succession we have been conducting experiments with a considerable number of special crops; some of which are not very well known over the Province. We are here presenting a fuller report of these special crops than on any previous occasion, and are saying but little on our experiments in methods of cultivation, dates of seeding, selection of seed, application of fertilizers, etc., which can be dealt with more fully in another year after the experiments have been again repeated.

The experimental grounds consist of about forty-five acres, and are located in the rear of the main college building. The land has a gentle slope towards the south-west. The soil is what might be termed an average clay loam. One-quarter of the land is manured each year with about fourteen good loads (20 tons) of farm yard manure per acre. It will thus be seen that the land receives farm yard manure once every four years. No commercial fertilizers are used except in distinct fertilizer experiments, which occupy from two to three acres each year, and on which tests are made to ascertain the comparative value of different fertilizers with different crops. The plots vary in size according to the requirements of the different experiments, and the yields per acre are determined from the actual yields of the plots in every instance.

OATS (*Avena Sativa*).

As in the case of other cereals, the early history of oats is enveloped in mystery. They have been grown so long in cultivation, with no distinct records to guide us to their original country, that it still remains unknown. The wide range of soils on which oats grow to advantage, and the comparatively low temperature in which they come to their maturity, have rendered them well adapted for cultivation in many countries. In Scotland, we find oats cultivated to its northern extremity, and in Norway they grow as far north as lat. 65°.

The area devoted to oats in Ontario annually, is greater than that used for all the other cereals combined. In 1899, no less than 2,363,778 acres were devoted to the cultivation of oats in this Province.

Our Experiment Station has spared no pains in conducting experiments with different varieties of oats, to ascertain the most suitable kinds for cultivation throughout the Province. No less than two hundred and eighteen varieties in all have been grown on uniform plots in our experimental grounds within the past thirteen years. The greater number of these have now been grown for five years in succession and definite data have been obtained each year regarding the height of the plants, the strength of straw, the susceptibility to rust, the yield of grain, the yield of straw, the weight per measured bushel, etc., of each variety. Seed of promising varieties has been imported from England, Scotland, Russia, Germany, France, New Zealand, and many other countries, and the foreign varieties have been tested under similar conditions with all our Canadian varieties.

The following list gives the weight per measured bushel, tons of straw per acre, and bushels of grain per acre of each of seventeen of the leading varieties grown for a period of nine years—the figures in every instance being the average of nine years' results.

No.	Varieties.	Pounds per measured bushel.	Tons of straw per acre.	Bushels of grain per acre.
1	Joanette Black	35.6	2.8	89.3
2	White Siberian	34.2	2.6	86.3
3	Oderbrucker	31.5	2.5	82.6
4	Waterloo	31.9	2.5	82.2
5	Vick's American Banner	31.4	2.3	81.9
6	Probsteier	32.8	2.3	81.3
7	White Schonen	32.7	2.2	81.2
8	Bavarian	31.4	2.8	81.0
9	Poland White	36 5	2.7	80.9
10	Improved Besthorne	33.0	2.3	80.0
11	Danebrog	33.0	2 4	79.5
12	Holstein Prolific	32.4	2.2	78.5
13	Wide Awake	33.6	2.3	77 2
14	White Egyptian	35.9	2.7	73.8
15	Early Gothland	36.2	2.3	67.4
16	Clydesdale	38.8	2.4	66.3
17	Black Tartarian	30.7	2.4	65.6

These seventeen varieties have given the best results among one hundred and twenty-nine different varieties.

The *Joanette*, which stands at the head of the list in yield of grain per acre, is a black oat which was imported from France in the spring of 1889. It possesses a very short straw, and is suitable only for sowing on land which naturally produces a large amount of straw. As this variety stools abundantly there is great danger of using too much seed. Four pecks per acre is usually quite sufficient. As the grain is apt to shell if allowed to become thoroughly ripe, it is best to cut while the crop is somewhat green. The crop should be bound in small sheaves, as the straw is fine and large sheaves are too slow in drying. The grain of the Joanette oats is of excellent quality, as it is one of the thinnest hulled varieties in cultivation. The thinness of the hull, however, makes it necessary to use caution in threshing the crop, in order to prevent a large amount of the seed from being hulled in passing through the separator. All things considered, the Joanette is an excellent variety of oats for some farms in Ontario and a very poor one for others. The *White Siberian*, which comes second in the list in average yield of grain per acre, was imported by the College from Russia in the spring of 1889, and has given excellent satisfaction. It produces a long straw, and is well suited for medium to poor soil. The grain is white in color and of excellent quality. A committee appointed by the Oatmeal Millers' Association of Ontario examined eighty-one varieties of oats a few years ago, and pronounced the White Siberian a variety well adapted for the manufacture of oatmeal. Not only has it given excellent results in the experimental plots, but it is now grown almost exclusively, and with very satisfactory results, in large fields on the College farm. It has made the highest record of all the varieties of oats sent out over Ontario for co-operative experiments within the past seven years. It is now grown

extensively by Ontario farmers ; in fact, it is one of the most popular oats in Ontario at the present time. It is also interesting to know that all the Siberian oats which are now grown in Ontario originated from $\frac{3}{4}$ of a pound of seed which were sown in our experimental grounds in the spring of 1889 The *Oderbrucker* variety, which comes third in point of yield per acre, was imported by the College from Germany. It is also a white oat of good quality. The straw, however, is not so stiff as that produced by the Siberian variety, and the grain weighs somewhat less per measured bushel. The *Vick's American Banner* has been a very popular oat in Ontario. It will be seen, however, that the Siberian variety has given an average of about $4\frac{1}{2}$ bushels of grain per acre more than that produced by the American Banner from the average results of the two varieties grown side by side for nine years in succession. It will also be observed that the grain of the Siberian oats weighs nearly three pounds per measured bushel more than that of the American Banner.

Among the varieties which have been grown for a shorter length of time than those given in the above list, we would specially speak of the *Peerless*, *Improved American*, *Daubeney* and *Early Blossom* as among those which have made the highest records. The *Daubeney* is the earliest oat which we have ever grown in our trial grounds. The grain is white and the straw is of medium length. The variety is now grown by several farmers in Ontario, and can be used to advantage in mixing with peas or barley for the production of green fodder or of grain.

Winter Wheat and Spring Wheat.

The wheat plant appears to have been known and valued from the earliest times. As it will thrive successfully in a great range of climate, the inhabitants of many countries enjoy the advantages of its cultivation. There are, in all, seven distinct types of wheat, and to one or the other of these types all varieties belong. The seven types are as follows : 1, the common, fine, or soft wheat (*Triticum sativum*), 2, turgid or toulard (*T. turgidum*), 3, hard or flinty wheat (*T. durum*), 4, Polish wheat (*T. polonicum*), 5, spelt (*T. spelta*), 6, starch wheat (*T. amyleum*), and 7, one-rowed wheat (*T. monococcum*). Nearly all the varieties of both spring and winter wheat which are grown in Ontario belong to type No. 1, the common wheat (*Triticum sativum*), although representatives of all the different classes have been grown in our experimental grounds. Some of the best known representatives of other types are as follows : Wild Goose spring wheat, Medeah spring wheat, Algiers spring wheat, Poland spring wheat, Miracle winter wheat, etc. For the sake of convenience, we have arranged our wheats for this report under three heads, namely : 1, winter wheat ; 2, spring wheat with hollow straw, and 3, spring wheat with solid or semi-solid straw. All the varieties of classes No. 1 and No. 2 belong to the common wheat (*Triticum sativum*).

Winter Wheat.—In the autumn of 1898, eighty-seven varieties of winter wheat were sown on plots uniform in size and shape. The land on which these varieties were sown was quite elevated and had a general slope towards the west, and was in one of the most exposed positions possible, as it thus got the full sweep of the cold winds from the west. The snow did not remain on the plots in any large quantities ; and, as there were no fences or obstructions near the plots, the snow was very evenly distributed over the entire surface devoted to the experiment. It will be remembered that the winter of 1898-9 was one of the severest for wheat of any for many years past. Hundreds of acres which made an excellent showing in the autumn were plowed up in the spring, owing to the wheat being so badly killed out. On examining our plots in the spring, we found that the wheat was very badly killed, but that some varieties had come through the winter much better than others. As this test was a fair one, a knowledge of the manner in which the different varieties came through the winter furnished valuable information regarding the relative hardiness of the wheats. Those varieties which came through the winter the best are given below, and they are arranged in order of merit starting with the best : 1, Tasmania Red ; 2, Red Velvet Chaff : 3, Red Wonder ; 4, Prize Taker ; 5, Standard ; 9, Soules ; 7, Siberian ; 8, Dawson's Golden Chaff ; 9, Pride of Genesee, and 10, Early Arcadian. The varieties which were almost entirely destroyed were ; 1, German Emperor ; 2, Harvest King ; 3, World's Fair ; 4, Mealy ; 5, Golden Drop ; 6, Rudy ; 7,

Poole; and 8, Diamond Grit. The Early Genesee Giant, Early Red Clawson, American Bronze, Treadwell, Longberry No. 1, etc, occupied an intermediate place in regard to hardiness.

In connection with the above, it may be well to give a summary of the results of our experiments with winter wheat in former years, as follows:—

1. The average results of winter wheat growing on the experimental plots for nine nine years in succession are as follows: Weight of grain per measured bushel, 60 2 lbs.; yield of straw per acre, 2.07 tons; and yield of grain per acre, 39.5 bushels.

2. *Dawson's Golden Chaff* has given the largest average yield of grain per acre among seventy varieties of winter wheat grown at the Ontario Agricultural College for five years; also among eleven leading varieties tested over Ontario in 1893, nine varieties in 1894, 1895 and 1896, and seven varieties in 1897, 1898 and 1899.

3. The *Early Genesee Giant* variety of winter wheat is a close rival of the Dawson's Golden Chaff variety in the small plots in the Experimental department and in the large fields in the farm department of the Agricultural College, and also in the co-operative experiments conducted throughout Ontario.

4. Winter wheat which did not lodge until cut, produced a crop more than double the value of that which became lodged before it was ripe.

5. In five years' experiments with varieties of winter wheat, the American Bronze, Dawson's Golden Chaff, and Early Genesee Giant varieties possessed the stiffest straw of all the large yielders of grain.

6. Large plump kernels of winter wheat gave much better results than those which were small, plump, shrunken or broken.

7. In the average of six years' experiments in sowing winter wheat at different dates, it was found that when the wheat was sown later than September 9th, the crop was usually much poorer than when the seeding took place on or before that date.

8. As a crop to plow under for green manure in preparation for winter wheat, peas have given the best and buckwheat the poorest results.

9. In an experiment in cutting winter wheat at different stages of maturity for several years in succession, it was found that the largest yield of grain and the best quality of seed were obtained from the crop which was allowed to ripen fully before cutting.

10. Winter wheat, badly infested with "stinking smut," has been very effectually treated three different years by the use of either copper sulphate or hot water.

Spring Wheat.

We have grown one hundred and thirty-eight varieties of spring wheat within the past eleven years. The greater number of these varieties belong to the common or fine wheats (*Triticum sativum*). In the spring of the present year, thirty varieties of common spring wheat were sown. Of this number, the Welland Fife, New York, Red Fife, Lost Nation, Champion Bearded, Preston and Amethyst produced the largest yield of grain per acre.

In averaging the results of all the varieties of common spring wheat which we have grown under similar conditions for seven years, we find that sixteen varieties have given an average of upwards of 25 bushels each per acre. The following table gives the average of the results for the seven years.

The *Red Fife*, which stands at the head of the list in yield of grain per acre, is the old standard wheat well known in Ontario and Manitoba. The *Herison Bearded* variety, which comes second on the list, was imported from France in the spring of 1889. Although it has given an average of one-half bushel per acre less than the Red Fife, it will be observed that the grain weighs nearly three pounds per measured bushel more than that of the Red Fife variety. A committee appointed by the Dominion Millers' Association of Ontario examined fifty-seven varieties of spring wheat and pronounced the Herison Bearded a first-class milling variety. It grows a medium length of straw, which usually stands upwell. The head is very short and compact and is bearded. The variety which comes fourth in the list, namely, the *Wellman Fife*, is a wheat which is grown quite largely in some of the North-Western States of the American Union, and is prized very highly. It has made an excellent record in the co-operative experiments over Ontario, occupying first

place in yield per acre among the three varieties sent out and tested on forty-three Ontario farms in 1899, the average yield of grain of the Wellman Fife for the past season being 23.5 bushels per acre.

No.	Varieties.	Pounds per measured bushel.	Tons of straw per acre.	Bushels of grain per acre.
1	Red Fife	58 8	2.0	30 8
2	Herison Bearded	61.6	2.0	30.3
3	Saxonka	60.9	1.9	29 8
4	Wellman Fife	58.5	1.9	24.2
5	Red Fern	60.2	2.0	29 0
6	White Russian	57.8	1 9	28.9
7	Konisburg	60.7	1.8	28.5
8	Pringle's Champion	59.6	1.8	27.7
9	Blue Democrat	59 5	2.0	26.9
10	Lost Nation	57.9	1.8	26.6
11	White Fife	58.5	1 9	26.3
12	Colorado	59.0	2 0	15 8
13	Rio Grande	59.1	2.0	25 7
14	McCarlin	59.1	1.9	25.5
15	Manitoulin	58.5	1.7	25 2
16	Velvet Chaff Blue Stem	56.2	1 8	25.1

Among the varieties of spring wheat which we have grown for less than seven years, we have found the Speculation or Thick Set, the Salzer's Marvel, the Red North Dakota, and the Preston to be among the most promising.

Several varieties of spring wheat having a solid straw have been grown on our plot for a number of years, and some of them have shown themselves to be very heavy yielders; in fact five or six have given decidedly larger yields per acre than the very best of the common varieties. The following table gives the average yield per acre of each of six varieties of spring wheat belonging to this class for seven years in succession:

No.	Varieties.	Pounds per measured bushel.	Tons of straw per acre.	Bushels of grain per acre.
1	Wild Goose	61.9	2 0	39 5
2	Medeah	61.1	2.0	35 8
3	Bart Tremenia	62.5	1.8	34.9
4	Sorentino	60.3	2.1	32.9
5	Algiers	58.8	2 0	32.6
6	Ontario	57.7	2.0	22.9

It will be seen from the foregoing table that the *Wild Goose* has given decidedly the largest yield per acre of any spring wheat which we have grown. In former years millers paid much less per bushel for this variety than for the common varieties of spring wheat, which were much easier to grind. The Wild Goose is not only very hard to grind, but makes a yellow flour which gives a yellow appearance ance to the bread. During the last three years, however, there has been a considerable demand for the Wild Goose variety of spring wheat for export to Italy for the manufacture of macaroni; and this demand has become so keen that it has placed the price of Wild Goose wheat even higher than that of the finer varieties. So long as this demand keeps up, it is doubtful whether there is any other variety of spring wheat that will be so profitable for the farmers to grow as the Wild Goose variety.

Six-Rowed Barley (*Hordeum Hexastichum*).

Six-rowed barley has been under cultivation in the southern part of Europe from the earliest times. Barley is one of the hardiest of the cereals, and can be raised through

a great range of climate. It is cultivated with success north of the Arctic Circle and at high altitudes in the Torrid Zone. The grain is used for culinary purposes, for feeding to farm stock, and for the manufacture of beer.

In the summer of 1899 fifteen varieties of six-rowed barley were grown in the Experimental department. Of these varieties the Mandscheuri, Scotch Improved, Common Six-rowed, Mensury, Imperial Six-rowed, California Brewing, and Six-rowed Baxter's Improved gave the largest yields per acre. The heaviest weights per measured bushel were produced by the Oderbrucker, Four-rowed Canadian, North-western, Scotch, Silver King and Manitoba Six-rowed, each of which produced upwards fifty-four pounds per measured bushel. The heaviest weight per measured bushel of all the six-rowed barleys was produced by the Manitoba Six-rowed, which gave an average of upwards of fifty-six pounds.

A large number of varieties of six-rowed barleys have been tested in the experimental grounds for several years in succession. The following nine varieties have given the largest average yield of grain per acre among all those tested for five years in succession. The Success variety, regarding which so much has been said recently, is also included in the list.

No.	Varieties.	Pounds per measured bushel.	Tons of straw per acre.	Bushels of grain per acre.
1	Mandscheuri	51.2	2.0	77.9
2	California Brewing	47.8	1.8	68.2
3	Oderbrucker	53.0	1.8	67.6
4	Scotch Improved	52.5	1.8	67.6
5	Imperial Six-rowed	52.2	1.7	67.2
6	Four-rowed Canadian	52.0	1.8	66.4
7	Mensury	52 1	1.7	65.2
8	Common Six-rowed	52.4	1.7	65.1
9	Six-rowed Baxter's Improved	52.5	1.8	61.3
12	Success	47.8	1.3	41.5

The *Mandscheuri*, which stands at the head of the list in average yield of grain per acre, was imported by the Agricultural College from Russia in 1889. It produces a good length of straw, which usually stands up well and is comparatively free from rust. Not only has it given good results in the experimmental grounds, but it has been grown with most satisfactory results in large fields on the College farm. It has been also distributed throughout Ontario in connection with the co-operative experimental work, and as a heavy yielder it has given decidedly the best results of all the varieties of barley which have been tested over the Province. The *California Brewing* variety, which comes second on the list, possesses a very stiff beard, which is very difficult to remove from the grain. The grain weighs light per measured bushel, and the straw is apt to lodge considerably before it ripens. The third variety on the list was imported from Germany, and to the *Oderbrucker* variety belongs the credit of producing the barley which has given the heaviest weight per measured bushel of all the kinds which have been grown in our experimental grounds for five years in succession. It will be observed, however, that the Oderbrucker yields about ten bushels per acre less than the Mandscheuri when they are grown under similar conditions. The Oderbrucker is also considerably weaker in the straw than the Mandscheuri. Much has been said of late years regarding the variety known as the *Success*, which has the advantage of being very early and of producing no beards. The weight of barley per measured bushel, however, is light, and the yield per acre is much less than that of some other varieties. There is no other barley in Ontario which has given so good all round satisfaction in the production of grain as the Mandscheuri, and we are pleased to notice that it is now grown quite extensively throughout the Province. It will be seen that there is a greater difference between the Mandscheuri and the Mensury than there is between the Mensury and the Common Six-rowed varieties of barley.

Two-Rowed Barley (*Hordeum Distichum*).

The two-rowed barley is easily distinguished from the other species by the head being more elongated and by their being two distinct rows of grain from one end of the head to the other. The heads of some varieties are long and slender, while those of other varieties are short, very broad at the base, and taper towards the extremity. The two-rowed barley is largely cultivated in England and in Central Europe, but it is not grown to any great extent in Ontario, although great efforts were made a few years ago by the Dominion Government to have it grown more extensively by Canadian farmers for exporting to England. With this object in view, the Canadian Government imported 10,000 bushels of the Carter's Prize Prolific Barley from England and sold the same to Canadian farmers at $2.00 per bushel in order to get it introduced.

Within the last fifteen years we have tested upwards of fifty varieties of two-rowed barley at the College. The following list gives the average results in weight of grain per measured bushel and in yield of straw and grain per acre of the twelve varieties which have produced the largest average number of bushels of grain per acre in five years' tests.

No.	Varieties.	Pounds per measured bushel.	Tons of straw per acre.	Bushels of grain per acre.
1	New Zealand Chevalier	52.7	2.3	63.8
2	Gold Foil Hansford's	53.5	2.3	63.2
3	French Chevalier	53.1	2.3	63.1
4	Empress	52.8	2.2	62.5
5	Two-rowed Canadian	52.4	2.0	60.5
6	Kinna Kulla	52.0	2.0	58.9
7	Jarman's Selected Beardless	54.7	1.7	58.3
8	Two-rowed Italian	52.6	2.1	58.1
9	Selected Canadian Thorpe	52.8	1.9	56.8
10	Vermont Champion	54.4	1 8	56.1
11	Highland Chief	53.5	2.0	55.9
12	Duckbill	52.9	1.9	55.4

It will be observed that the *Carter's Prize Prolific* variety is not included in the list. We imported some of that variety from England in 1889; and after growing it for five years, we discarded it from our experiments, for the reason that it came twenty-ninth in yield of grain per acre among thirty-seven varieties grown for five years in succession. The *New Zealand Chevalier* and the *French Chevalier* both occupy a high place in the average results of the varieties grown within the past five years. The seed of the *Kinna Kulla* barley was originally imported by the College from Sweden in 1889. The crop produces straw of medium length, which stands up remarkably well. The *Duckbill*, which has perhaps been grown in Ontario more extensively than any other two-rowed variety, stands twelfth in the list of yield of grain per acre among the two-rowed barleys grown since 1895.

In the results of the past year, the French Chevalier, New Zealand Chevalier, Two-rowed Italian, Kinna Kulla and Duckbill varieties were among the largest yielders. The Jarman's Selected Beardless, however, produced grain which weighed the heaviest in weight per measured bushel of all the kinds under experiment; the weight being fifty-eight pounds, which is perhaps the heaviest weight produced by any barley in any one year in our experimental grounds since 1889.

An important point in connection with nearly all varieties of two-rowed barleys is that they are from one to two weeks later in reaching maturity than the six-rowed barleys. This characteristic gives some of the two-rowed varieties special value for mixing with oats or peas to be grown either for green fodder or for the production of grain. It has been found that barley and oats sown together produce more grain per acre than when sown separately; and unless a very early variety of oats is used, it is necessary to have a two-rowed barley for mixing with the oats, in order that the two grains may mature about the same time.

Hulless or Naked Barley (*Hordeum decorticatum*)

The grain of hulless barley usually weighs about 60 pounds per measured bushel, while the standard weight of the common varieties in Ontario is 48 pounds per measured bushel. The skin of the hulless varieties is fine and transparent and is white, purple or black in color. The grain resembled wheat more than barley. The straw is apt to be weak, and when ripe becomes so brittle that the heads are easily broken off. Some of the varieties possess heads with six-rows and others with two-rows.

We had eleven varieties of hulless barley under experiment during the last season. Of these varieties, the *Guy Mayle* gave the largest yield per acre, namely, 50.4 bushels per acre, and the Large Skinned gave the lowest yield, or 37.1 bushels per acre. The weight per measured bushel of both the Black Hulless and the Purple varieties was 65.9 pounds. All the varieties under experiment during the year produced grain which weighed upwards of 60 pounds per measured bushel.

The following table gives the average weight per measured bushel and the yield of straw and of grain per acre of six of the highest yielding varieties of hulless barley among those which have been grown in our experimental grounds for five years in succession.

Varieties.	Pounds per measured bushel.	Tons of straw per acre.	Bushels of grain per acre.
1. Guy Mayle	61.7	1.4	45.9
2. Purple	64.0	1 6	43.1
3. Black Hulless	63 7	1.5	42 3
4. Large Skinned	60 0	1 7	38.1
5. Hungarian	59.6	1.5	37.7
6. Winnipeg No. 2	60.3	1.7	37.4

The standard weight of 60 pounds per measured bushel has been used for the hulless barley throughout in reckoning the number of bushels per acre as given in the last column of figures in the preceding table.

The *Guy Mayle* variety which stands at the head of the list in yield per acre for five years produces a grain of purple color. The straw is of medium height and usually stands up fairly well. The *Black Hulless* variety, which comes third on the list, has perhaps been grown more extensively throughout the Province of Ontario than any other variety of hulless barley. It yields well and weighs heavily per measured bushel, but the straw is very weak, and is apt to be badly lodged before the crop is harvested. As some of the varieties of six rowed barley grow a stiffer straw and produce a much heavier yield of grain per acre than any of the hulless barleys, it is usually found more profitable to grow the six-rowed varieties in general farming in Ontario. However, some of the hulless varieties may be grown to good advantage under certain circumstances.

Winter Barley.

In the autumn of 1898, one plot of winter barley was sown in the experimental grounds. The crop grew splendidly in the autumn of the year and was very promising at the commencement of the winter, but in the spring of the year there was not a living plant to be found. We have sown one or more varieties of winter barley during each of the past eleven years and have found that in mild winters it comes through admirably and produces a heavy crop which gives a large yield of grain per acre. In severe winters, however, it is generally killed out completely. Although some seedsmen recommend the growing of winter barley quite extensively, the results of our experiments go to show that it is not advisable to grow it as a general crop in Ontario, unless some varieties can be secured which are more hardy than any which we have yet obtained; and we have tested every variety which we have been able to secure from Germany, France, the United States, etc.

Rye (*Secale cereale*).

Rye is the characteristic food-grain of middle and northern Europe, and is used extensively by fully one-third of the population of Europe. It can be grown advantageously in those districts in which the soil is unsuited for other cereal crops. The grain is used for making bread, in the manufacture of malt liquors, and as a food for live stock. Rye is sometimes used when young as a pasture crop and when more fully grown for soiling purposes and for the production of hay. The straw of the mature crop, being long and straight, is used in the manufacture of hats, mats and fancy baskets; but it is of little use as a fodder.

Spring Rye.—Three varieties of spring rye were grown in our experimental plots in the past season. The yields of grain per acre of the different varieties were as follows: Dakota Mammoth rye, 50.9 bushel; Prolific Spring rye, 42.1 bushels, and Colorado Giant rye, 24.5 bushels. Two of these varieties have now been grown for five years, and have been given the following yield of grain per acre: Dakota Mammoth, 38.5 bushels, and Prolific Spring rye, 36.8 bushels. The Colorado Giant rye has been grown for only three years in succession, and has given an average of 22.6 bushels per acre, which is considerably less than either of the other varieties.

Fall Rye.—Several varieties of winter rye have grown in our plots for a number of years with good success. In the autumn of 1898, three varieties were sown in the same section of the field as the winter wheat. They all came through the winter well, and were very strong and vigorous in the spring, while the wheat standing near by was very badly winter-killed. The Mammoth winter rye and Monster winter rye appear to be the same variety, and have given about five bushel per acre more than the common winter rye of Ontario.

Buckwheat (*Fagopyrum esculentum*).

Buckwheat is a native of Northern Asia and has been grown as a cultivated crop for fully one thousand years It grows and produces a marketable crop on very poor soil, and it thrives admirably in cold climates. It is mainly grown for the production of grain, but it is also used for soiling purposes and for plowing under as a green manure.

We have grown six varieties of buckwheat in our experimental grounds, although two or three of the varieties are very similar in every respect. The three main varieties, namely, the Japanese, the Silver Hull, and the Common Grey, have each been grown in our trial plots for five years in succession. The crop in 1898, however, was failure, and that of 1899 was lighter than usual. In the average results of the three varieties grown for four years we find that the Japanese produced 20.4 bushels, the Silver Hull 16.2 bushels and the Common Grey 14.6 bushels per acre. In 1899 the Japanese gave 15.7 bushels, the Silver Hull 10.9 bushels, and the Common Grey 11.4 bushels per acre. *The Japanese* variety, which stands at the head of the list in yield per acre for 1899, and also in the average for four years, has given the largest yield of grain per acre in the co-operative experiments over Ontario for three years in succession. It is a very vigorous grower and produces grain of large size. The grain of the Silver Hull variety is smaller and plumper than that of the Japanese.

Indian Corn or Maize (*Zea mays*).

Indian corn is a native of America, and its cultivation in the United States is very extensive. The United States Department of Agriculture estimates the corn crop of the world for 1898 at 2,637,165,000 bushels. Of the total crop of 1898, the United States produced over two-thirds. The country which produced the next largest yield was Hungary, which was closely followed by Roumania and by Mexico. Ontario came ninth in the list, with about 24,000,000 bushels as the yield for that year. Indian corn is used for pasture, green fodder, dry fodder, and silage; and the mature grain is used in a great many forms for culinary purposes and as a food for live stock.

We have grown in all no less than two hundred and twenty-six varieties of corn in our experimental grounds within the past thirteen years. For general purposes, we have found (1) that the *Mammoth Cuban* and the *Mastodon Dent* are well adapted for the warmer soils of Southern Ontario; (2) that the *Wisconsin Earliest White Dent* for

Southern and Central Ontario, and (3) that the *Salzer's North Dakota*, *Compton's Early* and *King Philip* for Central and Northern Ontario.

More detailed information regarding varieties and experiments in methods of cultivating corn, etc., will likely be given in bulletin form on some future occasion.

Teosinte (*Euchlæna luxurians*).

Teosinte somewhat resembles Indian corn, and grows to a height of from eight to ten feet in the Southern States. The variety usually grown produces a great many stalks from each root, the number sometimes reaching as high as forty. The crop produced per acre is said to be very large, and the fodder is liked by all kinds of stock. The seed is sown in the spring, and in climates suited to its growth the plants will produce several cuttings during the season. It may be fed either green or dry. As the Teosinte has given such good results in the warmer sections of the United States, some of the seedsmen of the North have been tempted to advertise it quite extensively. We have sown it in our experimental grounds for three years in succession. The germination has been rather slow and the crop has not reached a height of more than about three feet any year. From the knowledge gained from testing the crop during three years, we believe that it is entirely unsuited to the conditions which exist in Ontario, and we cannot at present recommend it to farmers as suitable to grow in Ontario for any purpose whatever.

Grasses.

Grasses are remarkably and evenly distributed in practically all portions of the inhabitable globe. In Ontario, no less than 2,505,422 acres were devoted to the hay and clover crop in 1899.

In all, forty eight varieties of grasses have been grown in comparative tests on the experimental plots at the College. These have included a large number of the cultivated grasses of England and America, and of several native varieties from Australia, Manitoba, etc. The following list gives the average yield in tons of hay per acre of each of twenty-one varieties of grasses grown for five years in succession:—1, Fringed Brome, 3.9; 2, Lime Grass, 3.3; 3, Western Rye, 3.3; 4, Bearded Wheat, 2.6; 5, Tall Oat, 2.5; 6, Timothy, 2.5; 7, American Lime, 2.4; 8, Orchard, 2.1; 9, Awnless Brome, 1.7; 10, Soft Brome, 1.6; 11, Meadow Foxtail, 1.4; 12, Canadian Blue, 1.4; 13, Meadow Foxtail, 1.3; 14, Red Top, 1.1; 15, Rhode Island Bent, 1.0; 16, Yellow Oat, 1.0; 17, Perennial Rye, 9/10; 18, Creeping Bent, 9/10; 19, Kentucky Blue, 4/5; 20, Fine Leaved Sheep's Fescue, 4/5; 21, Wild Timothy, 1/3. The varieties under the numbers 1, 2, 3, 4, 7, and 21 were imported from Manitoba, through the kindness of Mr. S. A. Bedford, Superintendent of the Dominion Experimental Farm in Manitoba. The hay of most of these varieties is somewhat coarse. It will be noticed that Timothy, which is so well known throughout Ontario, has made an average of exactly 2½ tons per acre in the five years' experiments. This is nearly 1¾ tons per acre less than the crop produced by the Fringed Brome grass. The Awnless Brome grass (*Bromus inermis*) gave an average of 4·5 of a ton per acre less than that produced by the Timothy.

Besides growing the grasses separately, we have grown them in a great many combinations, especially with different varieties of clovers. Two mixtures of grasses and clovers have been under test for the last five years. The different varieties and the quantity of seed per acre used in each mixture were as follows: *Mixture No. 1.* Meadow Fescue 6 pounds, Meadow Foxtail 3 pounds, English Rye 2 pounds, Timothy 3 pounds, Canadian Blue grass 4 pounds, Orchard grass 3 pounds, Red Top 2 pounds, Yellow Oat 2 pounds, Lucerne 4 pounds, White clover 2 pounds, Alsike clover 2 pounds, Red clover 1 pound, and Trefoil 1 pound, making a total amount of 35 pounds of seed per acre; and *Mixture No. 2.* Orchard grass 4 pounds, Meadow Fescue 4 pounds, Tall Oat grass 3 pounds, Timothy 2 pounds, Meadow Foxtail 2 pounds, Lucerne 5 pounds, Alsike clover 2 pounds, White clover 1 pound, and Trefoil 1 pound, making a total amount of 24 pounds of seed per acre. The average results for five years show that the yields of hay per acre from each of the two mixtures were as follows: Mixture No. 1, 2·6 tons; Mixture No. 2, 3.6 tons. While these crops were not pastured, the results show that Mixture No. 2 produced decidedly the larger crop. All the varieties in Mixture No. 2 are exceedingly

hardy, and for general purposes it is one of the best and most permanent mixtures which we have found, and can be used for the production of pasture or of hay.

Other experiments with different combinations of grasses and clovers for the production of *hay* in short rotations are now in progress; also experiments in sowing grasses and clovers in the autumn of the year with and without a grain crop; likewise in the spring of the year with and without a grain crop.

Millet.

Millets are grown extensively in Siberia, India, Japan, and China, where the seed is used largely as a human food. It is estimated that the seed of millet in one form or another is used as a portion of the food of fully one third of the inhabitants of the globe. In Ontario, however, its chief use is for the production of pasture, green fodder, or hay. Some farmers grow millet more or less extensively as a regular crop, but as a rule it is sown to supplement some other crop which from one cause or other has proven a partial failure. For instance, in the year 1885, we had frosts during the first two weeks of May on six separate nights, the thermometer going twenty-two degrees below the freezing point on one occasion. This injured the young clover very much, and caused a great reduction in the amount of hay for that year. Hence the demand for millet seed became very great, some farmers paying as high as two and three dollars a bushel for the seed. In the farm department at the College, six acres of millet were sown that year and eighteen tons of good hay were grown, which did admirable service the following winter in supplementing the clover as a winter fodder. It is also found that in some seasons the amount of rainfall is so abundant during the latter part May and the early part of June that it is impossible to get the corn planted in good condition; in which case the land can frequently be used to good advantage in growing millet, as it does not require to be sown until comparatively late in the season. In this way the loss of the corn crop will not be felt so seriously as it would have been if no fodder crop had been secured from the land. It will, therefore, be readily seen that the millet crop is frequently an important one for the farmers of Ontario, as it can be used so readily when other fodder crops are apt to be deficient.

Thirty one varieties of millet have been grown under experiment at the College for the purpose of gaining information as to the most suitable kinds of cultivation in this Province. Fourteen varieties have now been grown for five years in succession. These varieties belong to four distinct classes, as will be seen by the classification here made The following list gives the average yield of hay per acre of each variety for five years:

	Tons of hay per acre.
1. Broom-Corn Millets. (*Panicum miliaceum.*)	
Japanese Panicle	5.5
White French	3.1
Red French	2.7
2. Foxtail Millets. (*Chætochola italica.*)	
Holy Terror Gold Mine	5.3
Japanese Common	5.0
Golden Wonder	4.9
German or Golden	4.6
Magic	4.1
Salzer's Dakota	4.0
Hungarian	3.8
California	3.3
Common	3.1
3. Barnyard Millets. (*Panicum crus-galli.*)	
Japanese Barnyard	5.0
4. Pearl Millets. (*Penniscetum typhoideum.*)	
East India Pearl	4.9

For hay.—From the above table it will be seen that *Japanese Panicle* millet has given the largest yield of hay per acre, and that the Red French has given the smallest yield, the difference between the two varieties being 2.8 tons in favor of the Japanese Panicle. It will also be noticed that the varieties which have given the extremes in yield

per acre both belong to the Broom Corn class of millets. The Japanese Crus-galli variety, which has given an average of five tons per acre for the five years, yields heavily some seasons, but in others it gives rather poor results. In 1898, the crop produced by the Japanese Crus galli both at our Experimental Station and throughout Ontario were very light.

Three varieties of millet have been used in the co-operative experiments over Ontario for two years in succession ; and in averaging the results of successful tests made on ten farms, we found the varieties gave the following tons of green hay per acre, namely, Japanese Panicle, 6.4 ; Japanese Barnyard, 5 9 ; Hungarian Grass, 4.8.

For seed.—In 1899, twenty-two varieties grown in our experimental grounds were allowed to ripen and the crop was threshed. The following varieties produced the largest yields of seed per acre : Canadian, 35.8 bushels ; Chinese, 34.4 bushels ; California, 34.0 bushels, and Hog, 32.9 bushels. A number of varieties were also grown for seed in 1898 and in 1894. In 1898, the California gave a yield of 44.8 bushels per acre, which placed it second in yield of seed for that year ; and in 1894 the California stood at the head of the list, with a yield of 41.9 bushels of seed per acre. Taking the average of the three years, the *California* variety has produced the largest amount of seed per acre.

Sachaline (*Polygonum Sachalinense*).

Sachaline is a perennial plant, a native of northern Asia, where it grows in a moist climate and on wet land. A few years ago it was brought to this country and was most extravagantly recommended as a forage plant by a number of seedsmen in Canada and the United States. The following quotation is taken from a seedsman's catalogue for 1896 : "The claims made for it are : perfectly hardy—even in Siberia ; stands also the greatest heat ; ground does not need to be plowed before planting ; needs no cultivation, no manuring, no replanting ; grows in poorest of soil or in wet lands where no other forage plant will exist. Once planted it stands for an age. Stems or leaves, green or dry, are greatly relished by sheep, cattle and horses. It is more nutritious than clover or lucerne ; an excellent soil enricher. Grows 14 feet high by June and can be cut every month after till cold weather. The cultivation of Sachaline is very simple. Plant three feet apart each way at any season."

In the spring of 1895, twelve roots of Sachaline were purchased and also a quantity of seed. Both the roots and the seed were placed in good soil and plants were grown from each. The plants produced from the roots reached an average height of about two feet in 1895 and of three feet in 1896, and those from the seed an average height of from six to ten inches in 1895 and of seventeen inches in 1896. In 1897 and in 1898, the plants grew to a height of from three to five feet. The plants started to grow very early each spring and the new growth was nearly always frozen back, after which a fresh start was made. In the winter of 1898-9, all the plants but one were completely killed. The single plant which came through the winter alive did not start to grow until quite late in the season, and then the growth was very feeble. From our experience with the growth of Sachaline for four years we find it an unprofitable crop and entirely unsuited to our soil and climate.

Prickly Comfrey (*Symphytum Asperrimum.*)

Prickly Comfrey is a native of Caucasus and was very highly recommended and somewhat extensively introduced in this country a few years ago. It is a perennial and is propagated from the roots which are exceedingly hardy. The large coarse leaves grow luxuriantly, thus producing a large amount of forage.

In the spring of 1893, Prickly Comfrey roots were purchased and were planted in the experimental grounds, which were then located south-east of the main college building. The roots have been transplanted three times since that date and are still thriving fairly well, although the exceptionally severe winter of 1898-9 killed a few of them. Some of the others, however, were divided in the spring of the present year and we again have the full number of plants growing in the plot. We usually get three cuttings per season. The Prickly Comfrey is certainly a very hardy plant and an enormous producer of forage, but it is rather coarse and is not relished by the animals to which it is fed. It is said, however, that animals eat Prickly Comfrey fairly well after

they become accustomed to it. All things considered, it is doubtful whether Prickly Comfrey will ever be grown to any great extent in Ontario, where clover and other leguminous crops, which are valuable for fodder and as soil renovators can be grown so successfully. If, in some circumstances, it is very important to get a large amount of food annually from a small piece of land without fresh seeding each year, I know of no crop which is hardier or more abundant in its supply of fodder than Prickly Comfrey. The fodder from the plant may possibly be relished by cows, providing special care is taken in getting them accustomed to it by using it in small quantities at first and mixing it with meal, cut hay, etc., and then gradually increasing the quantity in the ration.

Giant Spurrey (*Spergula Maxima*).

The Giant Spurrey was grown quite extensively on the sandy soils in Michigan previous to 1893, at which time a bulletin was published by Prof. O. Clute, Director of the Station. In that bulletin the Spurrey was very highly recommended for light sandy soil. It is considered valuable, both as a soil renovator and for feeding to sheep and cattle.

As considerable was being said a few years ago regarding Spurrey, we wrote to the Michigan Agricultural College and secured a few pounds of seed and sowed it under different conditions in our experimental plots. The plants grew rapidly and produced seed in a very short time. The crop, however, was very light in all instances. Although it is some five years since the Spurrey was sown in our plots, we are not yet clear of the plants in those sections of the experimental grounds in which it was sown. Owing to the slow, slender growth of the plants and their rapid production of seed, it is almost impossible to pull all the plants before the seed is ripened and spread in the ground. We wish to caution our farmers against even testing the Spurrey on their farms, unless it is on the sandy soils in which almost nothing else will grow. Its rapid production of seed makes it a troublesome weed in cultivated land.

Yarrow or Milfoil (*Achillea millefolium*).

This plant is grown considerably in Europe and especially in England where it is considered to make a very valuable addition to sheep pastures. It is a perennial plant having white or pink flower clusters. In the spring of 1898, we sowed one plot in our experimental grounds with Yarrow seed. It germinated well and the crop made a good growth during the first year. Owing to the exceedingly severe winter of 1898-9, several of the varieties of grasses and clovers under experiment were badly winter-killed. The Yarrow, however, came through without any apparent injury from the cold weather. The plot was nicely covered with Yarrow plants which made a fairly even but not a very rapid growth. The crop was cut on the 11th of July, at which time the plants had reached an average height of 22 inches. The crop produced 3½ tons of the freshly cut Yarrow and 9 10 of a ton of the cured hay per acre. It is scarcely expected that this crop can be grown satisfactorily for the production of either green crop or of hay, but these figures give data regarding the hardiness of the plant during a very severe winter and its growth the following season. Those farmers specially interested in sheep raising in Ontario may glean some information from this experiment regarding the growth of Yarrow in our climate, and from a knowledge of its use in England can better determine for themselves whether or not it would be advisable for them to use Yarrow in their sheep pastures as is done in Europe.

Potato (*Solanum tuberosum*).

The potato plant, which is a native of Chili and as far north as New Mexico, is now cultivated very widely and produces a large portion of the food of mankind. Besides being used as a food, the potato is largely employed for the manufacture of starch, spirits, etc. No less than 168,148 acres were devoted to the production of potatoes in this Province in 1899.

A great deal of attention has been devoted to testing potatoes at our Experiment Station within the past few years. Upwards of two hundred varieties have been grown and twenty-four distinct experiments have been carried on with different methods of preparing seed, with different systems of cultivation, with the application of commercial

fertilizers, etc. The results of many of these experiments have been given in my annual reports from year to year. The most important results of the experiments conducted for several years in succession will form interesting material for a bulletin before long.

Of all the potatoes which have been grown in our experimental grounds, we have found the *Empire State*, *American Wonder*, *Pearl of Savoy*, and *Rural New Yorker No. 2*, among the very best varieties for general cropping.

Field Roots.

That root culture lies at the basis of good husbandry is the candid opinion of thousands of the most successful farmers of long experience. The root crop occupies an important place in a rotation, furnishes an excellent means for cleaning the land, prepares a splendid seed bed for a cereal crop, and supplies a large amount of succulent and palatable winter fodder which is rich in valuable food constituents and is easily digested by the animals. Roots assist greatly in the economical feeding of grain and coarse fodder, such as hay, straw, fodder corn, and corn silage, with which they are used. Root crops in general are much relished by all kinds of farm stock, but of special service are Swedish turnips for young stock and fattening animals; mangels for dairy cows, breeding ewes, and hogs; carrots for horses, and sugar beets for cattle and hogs.

I wish to emphasize the importance of securing the very best varieties of roots for the particular soil and locality in which they are to be grown. The following varieties are among the very best for Ontario: *Swedish turnips*, Hartley's Bronze Top and Buckbee's Giant; *mangels*, Evans' Improved Mammoth Sawlog, and Carter's Champion Yellow Intermediate; *carrots*, Pearce's Improved Half Long White; and *sugar beets*, New Danish Improved.

Not only is it important to get the best varieties, but it is of still greater importance to sow large, plump seed, having good germinating power. In the average of two years' experiments with turnips, mangels, carrots and sugar beets, we have grown from large seed an average of three and one-half tons of roots per acre more than from medium sized seed, and twenty-four tons per acre more than from small seed of the same varieties. It pays, therefore, to sift out all the small seed and sow nothing but the best. We sow mangels, carrots, and sugar beets about the first of May, and the Swedish turnips about the 20th of June. The seed is sown one inch deep in rows twenty-eight inches apart, with an ordinary root drill. When we sow on the flat surface, we get an average of one-half a ton of roots per acre more than when we sow on ridges. If we thin the plants when they are from one and one-half to two inches high, we get an increase of four tons of roots per acre as compared with thinning the plants when they are eight inches high. As the result of much experimental work, we now thin the plants to the following distances apart in the rows: *carrots*, four inches; *sugar beets*, seven to eight inches; and *mangels and turnips*, ten to twelve inches. The reasons for thinning thus cannot be given in this brief report. Soon after the seed is sown, the soil between the rows is stirred with a weeder, from which a few of the teeth have been removed. The cultivation is then done at intervals of about two weeks by means of a one-horse scuffler which loosens the surface soil, destroys the young weeds and preserves the soil moisture.

Chicory (*Cichorium Intybus.*)

The plants of chicory are used as a fodder crop and also for culinary purposes. As a fodder plant, it is spoken of as being specially adapted to very poor soil; and its long tap roots help to carry it through dry seasons when grown even on very dry land. It is principally grown as a fodder crop in Europe, but alfalfa is now supplanting it largely as food for live stock. The large-rooted variety of chicory has been grown in our experimental grounds during the past four years, although in 1898 the crop was practically a failure. The average annual yield of fresh roots per acre for 1896, 1897, and 1899 is 7 tons. In some parts of Ontario, Chicory is grown quite largely and the roots are hauled to a mill where they are dried and prepared as a market product. If they wish, farmers can grow, dry, and roast chicory for themselves and use it either as a salad or in combinationwith coffee. Chicory is grown in much the same way as a crop of parsnips or carrots.

Rape (*Brassica Napus.*)

The rape plant resembles the Swedish turnip in its leaf, and the cabbage in its root. It is, therefore, the leaf and the stem which form the valuable portion for feeding purposes.

Varieties.—There are several varieties of rape, such as the Dwarf Essex, Victoria, White Flowering, Umbrella, and German Summer. Of these varieties the Dwarf Essex and the Victoria are the most extensively advertised. We have had these two varieties grown under similar conditions during the past five years. The average result for the five years show that the *Dwarf Essex* variety has produced 23.2 tons and the Victoria 20.3 tons per acre. There is no other variety of rape which has given nearly so good satisfaction as the Dwarf Essex. The German Summer (bird-seed rape) should never be grown for agricultural purposes, as it seeds the same season as sown, and is, therefore, a variety poor in feeding properties and difficult to eradicate. This point should be carefully observed, as serious trouble has sometimes resulted from sowing large areas of this variety.

Soils and Manures.—The most suitable soils for rape are fairly moist loams, rich in vegetable matter. Soils deficient in vegetable matter should receive a coating of stable manure. A dressing of eighty pounds of nitrate of soda per acre when the plants are two inches high will usually increase the crop fully two tons per acre. Land should be prepared for rape somewhat similar to that for corn or turnips.

Seeding and Cultivation.—About the middle of June, large, plump seed should be sown at the rate of one pound per acre in rows thirty inches apart and to a depth of about one inch. A thorough stirring of the first two inches of the ground between the rows every ten days or so increases the growth of the rape wonderfully. Flat cultivation is generally preferable.

Feeding Rape.—Rape makes an excellent late summer and autumn pasture crop for fattening cattle, sheep and lambs, for which purpose we have used it extensively. One season we pastured over 600 lambs on rape and sold them for the Buffalo, Halifax and English markets. When rape is pastured by hogs, it is considerably wasted, and when fed to cows it is apt to give the milk an undesirable flavor.

Animals should never be turned on rape when hungry. There is not much danger of animals bloating if they are turned on gradually at first, allowed free access to an old pasture field, and furnished with plenty of salt. There is practically nothing gained by feeding grain to animals when on rape. Lambs gain in weight from eight to twelve pounds per month on rape alone. We have cut green rape and fed it to hogs in the months of August, September, October and November with marked success. We have have also fed it to cattle and sheep in the stable until after Christmas with good satisfaction.

Other Uses of Rape.—Rape grows best in cool weather. When sown on land where a cereal crop has been harvested, it frequently makes a good growth of plants which can be plowed under as a green manure or used for late fall pasture. Owing to its broad and spreading leaves, rape has a wonderful power of smothering weeds, and is, therefore, an excellent crop for cleaning the land.

Kale or Borecole.

Kale is a cultivated variety of Brassica oleracea, differing from ordinary cabbage in the open head of the leaves which are used for culinary purposes as greens, and also as food for cattle. The Jersey Kale or tall Jersey cabbage is used very extensively in the Island of Jersey as a fodder crop. Seed of some of the varieties of Kale has been imported by our Experiment Station from Jersey Island, England, Quebec and the United States, and the seed of other varieties have been obtained in Ontario. The yield of green crop per acre produced by the different varieties in 1899 is as follows: Marrow Stem Kale, 11.5 tons; Thousand Headed Kale, 11.4 tons; Georgia Collards, 10.6 tons; Tall Green Curled Scotch Kale, 9.9 tons; Jersey Kale, 9.8 tons; Hardy Curled Kale, 9.3 tons: Purple Sprouting Borecole, 9.1 tons; and Large Tall French Brussels Sprouts, 6.7 tons. Five of these varieties have now been grown in our plots under similar conditions for three years in succession, and the *Marrow Stem Kale* has produced the largest average yield of green crop per acre of the five varieties grown for the three years, the yield being

24.9 tons per acre. In 1897, each of the varieties of Kale was fed to dairy cows, and the milk and butter produced by the animals was carefully examined and found to possess more or less taint in every instance.

Cabbage (*Brassica oleracea*).

Although the cabbage has been used to a considerable extent in Great Britain as a food for sheep and hogs, but little has been done with this crop for field culture in Ontario. The seed of a few of the varieties which are more commonly used as a fodder crop in England was imported in the spring of the present year, and sown in our experimental grounds in the month of June. The seed was bought from the well known firm of Sutton & Sons, Reading, England. The experiment was conducted in duplicate, the seed being sown similarly to that of rape. The crop of the one experiment was harvested on September 9th and the other on October 3rd, and the plants of each variety were weighed immediately on being cut. In average yield of total crop per acre, *Sutton's Earliest Drumhead* gave 14.7 tons, Sutton's Earliest Sheep Fold 13 tons, Sutton's Best of All Savoy 11.7 tons, and Sutton's Late Drumhead 11.5 tons. These yields compare very favorably with the yield of the Dwarf Essex rape grown under similar conditions, the average yield per acre of which was 12.1 tons. The experiment with the different varieties of cabbage will likely be continued for a time, in order to secure fuller information regarding the comparative values of cabbage and rape as a food for live stock, especially lambs.

White Mustard (*Brassica* or *sinapis alba*).

White Mustard is grown in Great Britain as feed for sheep and as a catch crop for plowing under for green manure. A smaller quantity is sometimes sown with rape in order that the two can grow together as a sheep pasture. It is claimed that a small quantity of white mustard sown with the rape prevents lambs from bloating when pasturing the crop. It is considered by some feeders to be better than rape for late sowing in the fall, as its growth is more rapid than that of rape and will give a good pasture crop for lambs in a shorter length of time. The white mustard has been tested in our experimental grounds for several years, and the growth has been satisfactory. When sown in July or August, it usually gives a larger yield than when sown in May or June, at which time it is inclined to produce seed to rapidly to make a good pasture crop Mustard is, therefore, sometimes sown on land on which turnips or rape has failed and a fair-sized crop is generally secured.

One year we allowed the white mustard to ripen its seed, which was harvested and threshed, the yield being at the rate of 750 pounds of white mustard seed per acre. The well known codiment called "Mustard" is made from white mustard seed in much the same way that flour is made from wheat. The strongest flavored mustard, however, is produced from grinding the whole seed, as the bran contains the greater amount of pungent oil to which the flavor is chiefly due.

Field Pea (*Pisum arvense*).

The common field pea is a leguminous plant and a native of Italy. It has been in cultivation many hundred years and is chiefly grown for its grain. It is also used in mixing with oats for the production of green fodder or of hay. For soiling purposes, it produces a large yield of very nutritious food. The seed is exceptionally rich and is of great value for using with other grain in fattening cattle and hogs. The straw is used extensively as a food for sheep, and is sometimes mixed with other coarse fodder for feeding to dairy cows. Field peas can can be very satisfactorily used in Ontario as the cow peas are used in the Southern States for plowing under as a green manure.

Exactly one hundred varieties of peas have been grown in our experimental grounds within the past eleven years. The greater part of these have been tested for at least five years in succession. The average results for five years show that twenty varieties have produced a yield of upwards of thirty bushels per acre. The following list gives the average weight per measured bushel, and the average yield of both straw and grain per acre of the twenty largest yielding varieties. It also gives the results of few varieties which

come lower in yield, but which are quite well known throughout the Province, owing to the length of time they have been grown or to the recommendations which they have received elsewhere.

No.	Varieties.	Pounds per measured bushel.	Tons of straw per acre.	Bushels of grain per acre.
1	White Wonder	63.6	1.2	39.0
2	New Zealand Field	61.2	1.3	37.8
3	Glory	61.7	1.2	36.2
4	Early Britain	60.1	1.3	36.1
5	Egyptian Mummy	64.4	1.6	35.8
6	New Zealand Brown	59·4	1.4	35.3
7	Tall White Marrowfat	61.8	1.5	34.2
8	New Zealand Blue	62 5	1 2	33.9
9	Potter	61 8	1.4	33.1
10	Improved Grey	59 2	1.2	32.2
11	Chancellor	62.3	1.3	32 0
12	D'Auvergne	62.1	1.2	31.7
13	Common Grey	59 0	1.5	31.4
14	William the First	58 1	1.1	31.2
15	Princess Royal	60.4	1.2	31.2
16	White-Eyed Marrowfat	62.4	1.5	31.1
17	Early Racehorse	60.1	1.2	31.0
18	Nine Pod	59.5	1.4	30.7
19	Prussian Blue	61.7	1.8	30.4
20	Nimble Taylor	58.6	1.3	30.2
21	Crown	60.1	1.3	29.7
23	New Canadian Beauty	62 2	1.3	29.1
26	Black-Eyed Marrowfat	61.5	1 3	28.9
27	Sword	62.0	1.4	28.9
28	Golden Vine	62.7	1.3	28.5
35	Multipliers	61 9	1.6	27.2
36	Striped Wisconsin Blue	62.7	1.7	26.5
40	Pride of the North	60.4	.9	19.1

The *White Wonder*, which stands at the head of the list in average yield of grain per acre among all the varieties of peas grown for five years in succession, has a medium-sized white grain of good quality. This variety, however, requires good strong land, as the straw is shorter than that of most other varieties. The grain of the New Zealand Field pea is white and of about the same size as that of the Multipliers. The seed of both the White Wonder and the New Zealand Field pea was imported from New Zealand, and the supply of grain in Ontario is still quite limited. The Glory variety, which was imported from England, has a large white grain and a medium length of straw. *The Early Britain* is a brown pea imported from England, and one which has given excellent results both on our experimental grounds at Guelph and in the co-operative experiments throughout Ontario. It has been distributed with three other varieties in each of the past three years to Ontario farmers and has given the largest average yield of grain per acre of the varieties sent out in each of the three years. The Egyptian Mummy, which has been grown in Ontario for the past fifteen or twenty years, produces a large white pea, which weighs very heavy per measured bushel. The straw is usually quite coarse in growth. The Chancellor variety of peas, which comes eleventh on the list in yield of grain per acre, produces a small white pea and matures early. *The Prussian Blue* pea, which is extensively grown over Ontario, comes nineteenth on the list in yield of grain per acre. This pea, however, is well adapted to poor and average soil as it produces a large amount of straw; in fact, there are but few varieties which yield so large an amount of straw per acre as the Prussian Blue variety. The Golden Vine is the name of the little white pea known as the Common White pea of Ontario and as the Canada Field pea in the United States. The Golden Vine has given an average of about ten bushels per acre less than the White Wonder in the results from growing the two varieties under similar conditions for five years in succession.

In the spring of 1899, the Ontario Department of Agriculture received a communication from England to the effect that there was a big demand in England for what is known as *the Wisconsin Blue pea*, and that the price for that variety was

higher than for the small Canadian Blue pea. Samples of peas were also received by the Ontario Department of Agriculture from England, and the communications and samples of peas were forwarded to my office. I find the Wisconsin Blue pea to be identical with the Striped Wisconsin Blue, and the Small Canadian Blue identical with the Prussian Blue peas mentioned in the foregoing table. The following letter gives interesting information regarding the demand for each of the varieties of Blue peas for the English market:

CANADA GOVERNMENT AGENCY,

15 Water Street, Liverpool, England,

SIR,—By this mail I am sending you a sample of Wisconsin Blue peas which has been handed to me by a Liverpool firm (Kamm & Co.,) who state that these peas are grown largely in the district of Wisconsin, U.S.A., and that they have come into favor here as a cheap boiling pea, which is rapidly taking the place of the small Canadian Blue. They are shipped here in strong bags, holding about one and a half hundredweight, and the value to day is 36*s.* per 504 lbs. When steeped they swell well and boil soft and are in request for export and ships' stores. Last season there was a large trade, when the ruling price was 30*s.* for 504 lbs., but the higher price this year has checked the demand and small English Blue can compete successfully.

I beg to suggest that experiments be made with the samples that are being sent, so that the attention of Canadian agriculturists may be directed to the advantages they may be found to possess. There is no doubt that English buyers would prefer to purchase Canadian produce rather than that from the United States if a similar article can be exported from the Dominion. Believe me,

Yours very truly,

S. H. MITCHELL.

In order to glean more definite information regarding the productiveness of these two varieties of peas throughout Ontario, we distributed both kinds to a large number of farmers in the spring of 1899. Ninety of these experimenters conducted a successful test on their own farms and forwarded good reports. From these reports we learn that an average of 27.15 bushels per acre were produced by the Prussian Blue and an average of 25.15 bushels per acre by the Striped Wisconsin Blue. It might be well for the farmers in the Northern part of Ontario, around Owen Sound for instance, where there is no trouble from the pea weevil (*Bruchus pisi*) to consider the advisability of growing the Wisconsin Blue peas for the English market. The information here given regarding the comparative price of the two varieties in England, and the comparative yield of the two varieties at the Agricultural College for five years and on ninety farms throughout Ontario in 1899, should be of much service in coming to a conclusion as to the advisable course to pursue in trying to meet the demand for the English market.

The pea weevil (*Bruchus pisi*) is causing great damage in the pea crop in the southern part of Ontario, and we have found only two varieties which are entirely proof against its ravages. The two varieties are *the Egyptian* and *the Grass*, which are quite different from other varieties of peas in their character of growth. These two varieties of peas are described in this report under separate headings. Of the ordinary varieties of field peas we have found that *the Oddfellow* has been freest from the ravages of the weevil, and that *the Mummy* has taken the second place in this particular.

COWPEAS.

Cowpeas are extensively used in the Southern States as a green manure. It is somewhat difficult to make hay out of cowpeas, but with care an excellent quality of hay can be produced. Owing to the high feeding quality of cowpea hay it is frequently considered advisable to feed the crop and return the manure to the land.

There are over one hundred named varieties of cowpeas grown in the United States. Nearly all of these, however, require such a long season of growth that they are suited only to the warm climate of the South. A few of the earlier kinds have been grown in the Northern States, and have been tested at our Experiment Station at Guelph. One or

more varieties have been sown in our experimental grounds during each of the past eight or nine years. It has been found, however, that nearly all varieties are too late for the climate of Ontario, unless it is in some instances for producing a green crop for plowing under. They seldom grow to a height of more than ten to twelve inches, although an average height of twenty-five inches was made by the Black-Eye variety of cowpeas in 1899. The varieties which we have mostly grown are the Warren's Extra Early, Black-Eye, New Era and Whip-o-will. Of these varieties the New Era and the Whip-o-will proved to be the earliest. None of these varieties, however, have produced an average of more than about one and a half tons of green crop per acre during each of the past two years. During the entire period in which we have had the cowpeas under experiment no grain has been produced until the present year, when the plants became sufficiently well matured to produce a crop of peas, which was, however, very light. The yield of the New Era was the largest, but it was only a little over two bushels per acre. The Experiment Station will still be on the watch for some varieties of cowpeas which will be sufficiently rapid in growth to prove of value for cultivation in Ontario. We are at present unable to recommend any of the varieties which we have grown as being suitable for our northern climate.

Grass Peas.

The Grass pea is an annual legume which has been grown to a limited extent in Ontario for several years. The stems of the plants are flat and the whole crop is greatly relished by animals when used as a green fodder. It produces a moderate amount of grain, which is angular in form and very hard. One marked advantage of the grain of the flat pea is that it is entirely proof against the ravages of the pea bug (*Bruchus pisi*). We have grown the Grass pea for several years at the College, both as a grain and as a fodder crop. In the average results of four years' experiments, the Grass pea has produced 8.9 tons of green fodder per acre. This is more than double the yield produced by horse beans when both crops have been grown under exactly similar conditions. It is also a little over two tons per acre more in yield than the green crop produced by the Prussian Blue variety of peas when both were grown side by side for four years. As a producer of grain it has given a yield of 17 1-2 bushels per acre in the average tests for four years. The Grass pea has been sent out over Ontario in connection with the co-operative experiments for three years in succession and has been very popular among the experimenters as a producer of green fodder. We believe that in those districts of Ontario where the pea bug (*Bruchus pisi*) is doing so much havoc with the common varieties of peas, the Grass pea can be used to good advantage, and the crop can be utilized either as a green fodder or for hay, or can be allowed to mature and the grain and the straw both can be used for feeding to the live stock in the winter.

Egyptian Pea, Coffee Pea, Chick Pea, Etc. (*Cicerarietinum*).

The Egyptian pea is a leguminous plant grown extensively in the Mediterranean regions and in Central Asia. It has been used as feed for cattle and also as an article of human food for upwards of three thousand years. The seed is somewhat larger than the common pea and is enclosed in a short thick hairy pod, there being from one to two peas in each pod. The plant itself is seldom used except as a soil renovator, but the yield of grain is large and is ground into meal which makes a very valuable cattle food when fed in much the same way as cotton seed meal. As a human food, the peas are used in various ways. The ripened grain is sometimes prepared for the table in much the same way that we prepare our Canadian beans for culinary purposes. Egyptian peas are sometimes roasted and used as a substitute for coffee.

We have had the Egyptian pea under experiment since the spring of 1893. The crops of 1897 and 1898, however, were injured, and the results for these years are of no value. The average yield of grain per acre for 1893, 1894, 1895, 1896, and 1899 is 40.3 bushels, and the weight per measured bushel for the same period is 61.6 pounds. This variety of peas was sent out over Ontario in connection with the co-operative experiments along with three other varieties of peas in each of the years 1896 and 1897. In 1896, it was successfully tested on seventy-three Ontario farms, and gave an average of

27.4 bushels per acre, and in 1897 it was successfully tested on fifty-six Ontario farms and gave an average of 19.8 bushels per acre. It was found a little difficult to compare it properly with the other varieties of peas owing to the Egyptian variety requiring a somewhat longer period to mature. It usually takes about four months from seeding time until the crop is ready to harvest. The Egyptian pea requires good strong soil, giving poor results when sown on light and dry sandy soil, but producing a large crop which stands up well on rich low-lying ground. This variety seems to be well adapted to soils which usually cause the ordinary varieties of peas to produce too much straw that is apt to mildew. One very important point in favor of the Egyptian pea is that it is never troubled with the pea weevil, usually called pea bug (*Bruchus pisi*), which is causing very serious trouble to the pea crop of the southern part of Ontario.

Flat Pea (*Lathyrus sylvestris*).

The Flat pea is a perennial, legume, and is a native of Eastern Europe and Northern Asia. The plant grows very slowly at first and requires three years to reach its full size, after which it holds the ground for many years when grown under favorable conditions. It seems best adapted to arid regions where the system of irrigation is followed. Some of the Northern seedsmen have made extravagant claims for the Flat pea.

The seed of the Flat pea has been sown on the experimental plots at various times within the past nine years. The growth on some occasions has been quite satisfactory, and on others the crop has been poor. From our study of this plant, it seems unsuited for Ontario. The seed is very expensive; three years is required to bring it to full size, during which time there is much labor in keeping the land free of weeds; and the fodder produced is evidently less relished by animals than would be supposed from the claims made by those who are specially interested in its introduction. The following quotation is taken from the catalogue of a seedsman located in one of the Northern States: "All cattle, hogs, horses, indeed everything, relish *Lathyrus sylvestris*." They have grown *Lathyrus sylvestris* at the Experiment Station at Lansing, Michigan, for several years past, but have found in the feeding tests made there that live stock showed a decided distaste for the forage. Both sheep and cattle lost in weight when either the green or ensiled forage was fed as part of the ration.

Field Beans.

The common bean has been in cultivation from remote antiquity in Europe as well as in Asia. According to the report of the Bureau of Industries for Ontario, we learn that 40,485 acres of land were devoted to the cultivation of beans in the present year.

We have grown forty one varieties of beans in our experimental grounds within the past thirteen years. Of this number thirty varieties have been grown in two different places in our experimental grounds in each of the past three years. The following list gives the average of each of fifteen of the heaviest yielding varieties for the three years:

	Varieties.	Pounds per measured bushel.	Bushels of grain per acre.
1	White Wonder	65.8	23.3
2	Burlingame Medium	65.4	22.0
3	Schofield Pea	62.2	21.9
4	Pearce's Improved Tree	66.2	21.0
5	Medium or Navy	65 7	20.7
6	Snowflake	67 3	18.8
7	Wisconsin Tree	65.9	18.8
8	Burpee's Electric Tree	66.0	18.7
9	Day's Improved Leafless	65.6	18.6
10	Great Western	66.2	17.6
11	Boston Pea	66.0	17.2
12	Marrowfat	64.6	15.8
13	Dwarf Horticultural	60.1	15.3
14	Extra Early Field	62.8	14.5
15	Zealand Haricots	62.5	14.1

The White Wonder variety, which stands at the head of the list in average yield of grain per acre, is early in reaching maturity and produces a small white bean of good quality. The White Wonder is a good representative of the small white beans; the Navy, of the medium white beans, and the Marrowfat, of the large white beans. It will be seen, however, from the results in the foregoing list that the White Wonder gave an average of about $2\frac{2}{3}$ bushels per acre more than the Medium or Navy variety, and about $7\frac{1}{2}$ bushels per acre more than the Marrowfat variety. The Small White Field bean, which is not mentioned in the above list, comes seventeenth in the yield per acre. Three varieties of beans, under the names of Zealand Haricots, Giant Haricots, and Large White Haricots, which were reported by an English firm in the spring of 1897 as likely to give excellent results in Canada, have so far made low records. A quantity of each of these varieties was imported from England in the spring of 1897, and the seed of two varieties was sown in each of the past three years. The Giant Haricots, however, did so very poorly in the experiments of 1898 that they were dropped from the tests of the present year. In the average results of the three years' experiments, the Large White Haricots now occupy the last place in yield of grain per acre, the average being only 8.2 bushels, or not much over one-third of the yield produced by the White Wonder variety. The Zealand Haricots, however, stands fifteenth in point of yield of grain, as will be observed in the results given in the foregoing list.

Soy, or Japanese Beans.

The Soy beans, which are also called Soja beans, have been grown for a great length of time in Japan and in South-eastern Asia. The Soy bean is a leguminous plant, being similar to clover, peas, and our common beans in this respect. The plants are upright in growth, branch considerably, and usually contain a very large number of pods. The varieties of Soy beans are numerous, but many are late in maturing and are best suited to the warmer climates. There are some of the varieties, however, which are much earlier in maturing and are better adapted to the colder climates. About eighteen years ago Prof. Georgeson, then connected with the Agricultural College in the State of Kansas, imported from Japan fifteen varieties of the Soy beans, with which he conducted practical experiments on the Experiment Station grounds and found that five of the varieties gave good results. These five varieties were imported from Kansas some seven years ago for growing in our experimental plots. The Yellow Soy bean has given decidedly the best results among the five varieties which were obtained from Kansas. A few years ago the Agricultural College of Massachusetts also imported a number of varieties of the Soy beans from Japan, and three of these have now been tested in our experimental grounds here at the College.

The *Yellow Soy* bean which was imported from Kansas has given an average of eight tons of green crop per acre, being two and one-quarter tons per acre more than that produced from the common beans, and three and one-quarter tons per acre more than that produced from the horse beans. In each of the past three years the *Medium Green* Soy bean has given the largest yield of green crop per acre among the three varieties imported from Massachusetts, but in each of these years the Yellow Soy variety has given better satisfaction than the Medium Green in yield of crop per acre, although the results in 1898 were practically equal. We hope to grow these two varieties in larger lots, in order that we can compare them thoroughly in regard to their qualities for green fodder and for hay.

In the production of grain the Yellow Soy variety has produced the greatest yield n each of the tests made at the College. Of the different varieties tested during the ast three years, the Extra Early Dwarf is the earliest, the Yellow Soy the second arliest, the American Coffee Berry the third earliest, and the Medium Green is the atest to reach maturity. In many of the localities in Ontario the Medium Green variety Soy beans would be too slow in maturing to produce seed.

In the spring of 1899 three varieties were sent out over Ontario in connection with e co-operative work, to find out how these varieties would succeed over the Province. ie varieties distributed were the Medium Green Soy beans, American Coffee Berry and e Extra Early Dwarf Soy beans. The Medium Green and the American Coffee Berry ye upwards of twenty bushels of seed per acre, and the Extra Early Dwarf an average

of about thirteen bushels per acre. The Yellow Soy bean was not included in the experiment, as the seed of that variety was not available at the time. Arrangements have been made, however, to secure seed of this variety from the Kansas Experiment Station, for 1900. We feel justified in making somewhat extensive experiments with the Soy beans on account of the strong claims made for these beans in a few places where they have been grown. The following is taken from the bulletin issued by the United States Department of Agriculture on the Soy bean as a forage crop :

"The Soy bean thrives best in soil of medium texture well supplied with lime, potash and phosphoric acid. It endures drouth well, is not easily injured by excess of moisture, and may be grown about as far north as corn.

"The early varieties are best for seed crops, and the medium or late varieties for hay, forage and silage. Seed may be planted at any time during the spring and early summer, but preferably as soon as the ground becomes well warmed up. Drill one-half to three-fourths of a bushel to the acre; broadcast, three-fourths to one bushel.

"Little cultivation is needed when growing for forage; when for seed, keep weeds down until plants shade the soil. The Soy bean may be used for soiling, pasturing, hay, and ensilage, or the beans may be harvested and fed as grain.

"The forage is very rich in fat and muscle-making materials, and should be fed with fodder corn, sorghum, or some other feeding stuffs rich in fat-forming nutrients. The seed can be fed to the best advantage when ground into meal, and is almost equal as a concentrated food.

"Cut for hay when the plants are in late bloom or early fruit; for ensilage the crop can be cut later, but it is better to cut before the pods begin to ripen; for green forage cutting may begin earlier and continue rather later than for either hay or ensilage; the crop may be cut for seed after the pods become about half ripe.

"The Soy bean is excellent for green manuring and for short rotations with cereal crops. It should be well limed when plowed under as a green manure."

The Experiment Station at Kansas is growing the Soy beans very extensively; they had no less than sixty acres in Soy beans this year. From a bulletin issued from that Station on September 25th, 1899, we quote the following: "The sixty acres of beans average fifteen and one-half bushels per acre, making the cost of production fifty-five cents per bushel, or about eight dollars and forty cents per acre. Soy beans as a feed take the place of oil or gluten meal, and in composition are richer than oil meal. In feeding them to milch cows, fattening cows and hogs, they have given astonishing results. When the beans are let thoroughly ripen in the field, the straw is worthless, but if cut and cured while green makes excellent hay. They make excellent hog pasture and are a good crop for soiling."

We understand that at least five complex food products are prepared from the Soy beans in Japan, although the beans are seldom used alone as a vegetable. They are also frequently dried and roasted, and used as a substitute for coffee.

Horse Beans (*Fava vulgaris.*)

The horse bean is a coarse, rank-growing annual legume which is used quite extensively in Europe as a forage plant. There are several named varieties of horse beans, a number of which have been grown at the College. During each of the past nine years from one to six varieties have been under test, but in most of the years the crop has proved unsuccessful. During the hot, dry weather of the summer the leaves drop from the plants and the stems become dry and turn black. In some instances there was a second growth from the roots after the fall rains saturated the ground. Among the different varieties tested, the *small horse bean* has given the best results, the average yield of green crop per acre produced from this variety in the average of five years' experiments being 4.8 tons per acre. Even this variety, however, has not given general satisfaction as a fodder crop. We have found it to answer very nicely, however, for sowing late in the season with other leguminous crops, such as peas and Crimson clover, for plowing under as a green manure. The erect growth of the plants helps to hold the common peas up from the ground and thus assists in producing a satisfactory crop for plowing under. The horse bean seems to grow better in cool, moist weather than in the hot, dry seasons which occur so frequently in Ontario.

Velvet Bean (*Mucuna utilis.*)

The Velvet Bean, or Banana Field Pea, is a leguminous plant, and is becoming recognized more and more as a valuable crop for forage and for soil renovation in the American Southern States. In some places it is becoming a close rival of the Cow Pea. The vines grow long, and the forage closely resembles that of other beans.

It is quite doubtful whether the Velvet Bean will thrive so far north as Ontario. It has been sown in our experimental grounds for only one season, and in that test the results were quite unsatisfactory, but mainly owing to the poor germination of the seed. The crop will likely be tested again in our experimental grounds.

Clover.

Clover belongs to the order leguminosæ, or bean family. There are several varieties of clover grown more or less extensively throughout this Province, the most prominent of which are the Red Clover (Trifolium pratense), Mammoth Clover (Trifolium medium), Alsike Clover (Trifolium hybridum), and Crimson Clover (Trifolium incarnatum). Of these the Red Clover is decidedly the most popular and is grown the most extensively.

Each of the varieties of clover mentioned above, and also several other kinds, have been grown in our experimental plots more or less in past years. We have just completed an experiment in which we had the Common Red and the Alsike grown side by side in three different places in our experimental grounds. The following gives the average results of each variety for the first and the second cutting the same season :

Varieties.	Tons per acre of first cutting.	Tons per acre of second cutting.
Common Red Clover	2.9	.80
Alsike Clover	2.9	.08

These figures show that the yields of the first cutting of the two clovers were equal. It also shows that the second cutting of the Common Red was ten times as great as that of the Alsike variety.

The average annual total yield of Green Clover per acre for five years, including three separate seedings of each of three prominent varieties of clover, is given in the following summary results :

	Tons of green hay per acre.
Mammoth Red, seeded 1891, 1894 and 1897	7.2
Alsike, " " "	7 0
Common Red, " " "	6.2

The Mammoth Red variety is somewhat coarser and is several days later than the Common Red variety. The first crop of the Mammoth Red is generally large, but the after growth is usually very small.

Crimson Clover has been tested in each of the past six or seven years, and when sown in the spring produces an average of about one and one-fifth tons of hay per acre the same season ; but if sown in the autumn, as is the custom in some of the Eastern States, we find that on the average about four-fifths of the plants are killed during our severe winters. Although Crimson Clover has been very extensively advertised, we find that, unless in exceptional cases, it is very unreliable in our climate, and we cannot advise its general cultivation in Ontario.

Alfalfa or Lucerne (*Medicago Sativa*).

Lucerne is a native of Western Asia, and has been under cultivation for upwards of twenty centuries. It is considered the best crop for hay and for green fodder which can be grown in the Western States. It is a perennial legume which does not reach its full size until the third year. From two to four cuttings can usually be secured annually from a well-established Lucerne field.

That Lucerne is a crop of great importance for California, Colorado and other Western States is a well-established fact. As a plant suitable for general cultivation in the

extreme Northern States and in Ontario, however, it is not so certain. It has been tested here and there over the Province of Ontario for many years, but as yet it has not been grown to any large extent, except in two or three localities which seem to be specially adapted to its growth. In order to allow the farmers of Ontario to test Lucerne upon their own farms, we have distributed seed to Ontario farmers through the medium of the Experimental Union during each of the past nine years, sufficient seed being sent some years for plots containing sixteen square rods. The reports of these experiments are furnishing most valuable information regarding the growth of Lucerne in Ontario. Those who report success are certainly in the minority, although in some cases it has been grown quite successfully. Within the past year I have received letters from upwards of one hundred Ontario farmers who have grown Lucerne upon their own farms. These replies have been received from thirty-two counties. There appears to be more Lucerne grown in the counties of Brant, Haldimand, Wentworth, Welland and Lincoln than in all the rest of the Province combined, although there is a fair amount grown in Lambton and Middlesex, and a little in some of the other counties.

Lucerne is used for green fodder, for hay, and sometimes for silage. It is also sown alone and in combination with other grasses and clovers for pasture.

We have sown Lucerne as a separate crop, and also in mixtures of grasses and clovers, on a large number of plots on our experimental grounds within the past thirteen years. We have sown it alone in the autumn and in the spring, with and without manure and with and without a grain crop. We have also sown it on soils of different elevations. The accumulating results of these experiments are becoming more valuable year by year, and should be of service to the farmers of Ontario in reaching a reliable conclusion regarding the crop. In summing up our results we find that we get an average of between 17 and 18 tons of green Lucerne per acre annually.

Great caution should be used in pasturing Lucerne or considerable loss by death of animals may be the result. From a bulletin issued by the Department of Agriculture at Washington, giving the summary results of experiments conducted throughout the United States, I make the following quotation: "It is not safe to pasture either cattle or sheep on Alfalfa, as they are liable to bloat when it is fed green. Feed them the hay or practice soiling." Within the last year, I have received reports from three different farmers in Ontario, each stating that he had lost at least one cattle beast when pasturing on Lucerne. One report states as follows: "I am well satisfied with Lucerne for hay but did not like it for pasture. After being on it about two weeks, my cows began to bloat and I lost one from this cause. I think it was from eating the tops. The cows were not left on it very long at first and did not have access to water. Last summer, instead of letting the cows on the clover, I cut it and fed it to them green, although I fed all that the cows could eat." From another letter I make another quotation: "The cows bloated a little at first when pasturing on Lucerne, and after I had them in it for six weeks I lost one from bloating." It will, therefore, be seen that great care needs to be exercised in using Lucerne alone as a pasture crop.

We have also conducted a considerable number of experiments in curing Lucerne for hay, and find, when it is cut at the right time and cured rapidly so as to retain the leaves, a good quality of hay can be produced; in fact, we have produced hay which has been considered second to none produced on the farm. From a bulletin issued at Washington giving the summary results conducted at different Experiment Stations, I make the following quotation: "Cut Lucerne for hay when the first flowers appear. If cut in full bloom the hay will be woody and less nutritious. As Mr. Robert Harcourt, Assistant Chemist of our own Experiment Station, has been conducting an experiment by cutting Lucerne at different stages of growth and feeding the hay to sheep, some additional information of much value should be thus obtained. The Lucerne which is used was sown in the experimental grounds in the spring of 1895, and Mr. Harcourt used the crop of the fourth year for the investigations referred to.

We have sown Lucerne in at least nine different mixtures of grasses and clovers, and find that when used in a mixture the crop has been very permanent.

The results in the cultivation of Lucerne, both at our Experimental Station and throughout Ontario, should soon furnish valuable information regarding the practical side of Lucerne growing in this Province.

Sainfoin (*Onobrychis sativa*).

Sainfoin, also called Esparcette, is a perennial legume having a long root which penetrates deeply into the soil. It is mainly grown on dry calcareous soils which are either naturally or artificially well underdrained. It is grown for green fodder and for hay, and the hay is said to be better and more nutritious than that of red clover.

The seed of the Sainfoin has been sown in the Experimental department several times within the past fifteen years. As the seed of the Sainfoin loses its vitality in a short time, we find it rather difficult to purchase seed which will produce a good stand of plants. The young plants seem tender at first, and are apt to be crowded with weeds or grass unless the land is carefully looked after until the Sainfoin gets well established. The plants have proven themselves to be very hardy, and in nearly all cases have remained in the land until a change in the arrangement of the plots made it necessary to plow them up. In one plot, however, they remained for eight or ten years, holding their own throughout that length of time. The crop usually grows to a height of about two feet; and when in full bloom, the bright pink flowers are beautiful in appearance. The crop is cut for green fodder or for hay as soon as in full bloom. The average yield per acre of green fodder produced from the Sainfoin grown in our plots from seed sown in the spring of 1894, has been twelve tons. The crop is better suited for forage than for pasture. Good fresh seed should always be secured, and this shall be sown on land which is naturally dry as early in the spring as it can be worked to good advantage. The seed should be sown from an inch to an inch and a half below the surface, and may be grown with a light seeding of barley. An average of twelve tons of green Sainfoin per acre was produced from seed which was sown with about one bushel of barley per acre. This seeding of barley produced a very good crop, and was not thick enough on the ground to smother out the young Sainfoin plants.

Common Spring Vetch (*Vicia sativa*) and Hairy Vetch (*Vicia vellosa*).

For three years in succession the Common Spring vetch (*Vicia sativa*) and the Hairy vetch (*Vicia Vellosa*) have been grown under similar conditions in the Experimental department, in order to ascertain the comparative results of these two varieties in the production of green fodder. The Common Spring vetch is familiar to many of the farmers of Ontario, especially to the dairymen, who have used it in sowing with oats for the production of a green succulent food to supplement pastures during the dry part of the summer, or for making into hay for winter fodder. Common vetches have been tested over a large part of the American Continent, but seem the best adapted to Canada and to the North Eastern States.

The Hairy vetch is an annual, the seed of which was originally obtained from Western Asia. It is sown during April, May, and, June for summer forage, and in the warmer climates in August and September for winter forage. The hay produced from the Hairy vetch is of excellent quality. This variety has proved itself to be fairly well suited to the greater part of the American Continent.

The average results of the experiments conducted at the College during each of the past three years show that the Spring vetch gave a yield of green crop per acre of 1.9 tons in 1897, 3.4 tons in 1898, and 7 3 tons in 1899, or an average of 4.2 tons for the three years; and that the Hairy vetch gave a yield in green crop per acre of 12.7 tons in 1897, 7.8 tons in 1898, and 10.1 tons in 1899, or an average of 10.2 tons for the three years. These results show that the *Hairy vetch* has given an average of about two and a half times as much green fodder as the Common vetch in the average of three years' experiments. The seed of each of these two varieties of vetches was sent to experimenters throughout Ontario in the spring of 1898, and five reports of successfully conducted experiments were received. The average of these five experiments shows the Hairy vetch to have given 9 tons of green crop per acre and the Common vetch 6.9 tons of green crop per acre. It will thus be seen that the Hairy vetch has given much better results than the Common vetch in all the experiments conducted both at the College and over Ontario. Not only does the Hairy vetch produce a large yield per acre, but the crop is well suited for soiling purposes and appears to be relished by all classes of farm stock. The greatest draw back to the more extensive cultivation of the Hairy vetch in Ontario is the high

price at which the seed is sold. It may be possible, however, to obtain seed of the Hairy vetch at a much less cost in the near future. We hope to conduct more extensive experiments with the Hairy vetch in 1900 than on any former occasion, in order to glean as much information as possible in regard to this promising crop.

Tufted Vetch (*Vicia Cracca*).

The Tufted vetch, also called Cow vetch, Blue vetch, Bird vetch, and Chicken vetch, is a leguminous plant with numerous blue or purple flowers. It is grown in Europe as a fodder plant, and is specially recommended for cultivation on moist land. It is said to give excellent results when grown in shady places, as in orchards.

In each of the two years that we have tested the Tufted vetch in our plots it has grown quite successfully, producing 2.2 tons per acre one year and 3.9 tons per acre the other, making an average of a little over 3 tons per acre of the green crop. This yield was $\frac{2}{3}$ of a ton per acre more than that produced by the Common vetch in the same period. The fodder produced was tender and succulent, and appeared to be of good quality for feeding either as a green crop or as hay. As the yield, however, is so much less than that of the Hairy vetch, we cannot recommend it at present for general cultivation, although specially mentioned by some seedsmen as affording a provender of good quality,—a claim which undoubtedly is quite correct.

Kidney Vetch (*Anthyllis vulneraria*).

The Kidney vetch is a perennial plant which belongs to the leguminous family, and is a native of Europe. It is naturally well suited to very dry and barren soils, and especially those containing much lime. It is grown on poor soil as a forage plant, and is said to produce a very palatable fodder for live stock.

The seed has been sown in our experimental plots several times, and we have usually secured a good stand of plants. In the average of two years' experiments, we obtained 3.6 tons of green crop per acre. As a rule, the crop furnishes only a small amount of forage. In some seasons there is scarcely enough to make it worth while harvesting, and we believe that it possesses no real value as a crop for Ontario, unless it is for sowing with some other crop for a permanent pasture on a very poor sandy soil.

Lupines.

Two varieties of lupines, namely, the Yellow and the Blue, were sown in our experimental plots in the spring of 1899. The germination was fairly good. The Blue variety produced plants which averaged 18.7 inches, and the Yellow variety plants which averaged 13.5 inches in height. This growth was rather better than we obtained from growing lupines on former occasions. The plants, however, were very slender and did not mature any seed. Although the plants did better this year than formerly, we cannot recommend any varieties of lupines which we have yet tested for cultivation in Ontario.

Lentil (*Ervum lens*).

The lentil is cultivated largely in Europe and furnishes a good crop for forage. The grain is very rich, and is used as food for man and for domestic animals. Calcareous soils are said to be best suited to the growth of the lentil, which is an annual legume.

We have grown lentil in our experimental grounds during the past three years, and find that it produces plants from nine to twelve and a half inches in height, which are rather delicate in growth. The crop of green fodder produced is small, and the plants seldom ripen their seed. The past results from growing lentils at the College indicate that the crop is not likely to give satisfaction in Ontario.

Serradella (*Ornithopus sativus*).

The Serradella is an annual leguminous forage plant, native of southern Europe and of northern Africa. It somewhat resembles the spring vetch in appearance, and is said to do best on moist sandy soil. The forage is about the same in composition as red

clover, and is fed to cattle and sheep. As a green manure, it is said to be specially suitable in the improvement of sterile fields. Serradella seed was sown in the experimental grounds in the spring of the present year. The plants grew to an average of seven and one-half inches in height, and the yield of green crop was at the rate of 4.7 tons per acre. The plants were low and spreading in their growth, and from the general character of the crop it would appear to be better suited as a crop for pasture or green manure than for the production of green fodder or of hay. From the study of the growth of the serradella during the past year, we would consider that its general cultivation would not prove profitable in Ontario.

Peanut (*Arachis hypogœa*).

The Peanut plant is a legume which ripens its fruit under ground. The nuts are also called groundnuts, earthnuts, groobers, etc., and are grown as a commercial article. Virginia, North Carolina and Tennessee produce a large proportion of the pennuts grown in the United States. The soil in these States seems to be specially adapted to the successful growth of this plant. It is stated that the average yield of nuts per acre is about twenty bushels.

We have tested several varieties of peanuts during the past five years with varying results. In some seasons none of the varieties have produced nuts of value, while in other seasons the yields have been fairly good from a few of the varieties. The varieties which gave the best satisfaction in each of the past three years were as follows: In 1897, the White, Red, Root Hog or Die, Spanish, and Rennie's New Canadian; in 1898, Root Hog or Die, Savatilla, Spanish, Rennie's New Canadian, and White; and in 1899. Savatilla, Root Hog or Die, Inverson's Improved, White, Spanish, and Rennie's New Canadian. These varieties are arranged according to their yield per acre, starting in each year with the heaviest yielder. By taking three years into consideration, it will be seen that the *Root Hog or Die* variety has produced the largest average yield per acre, which has been followed pretty closely by the Savatilla, Spanish and White varieties. The yield of the Savatilla in 1899 was at at the rate of 14.3 bushels per acre, but the nuts were not quite so plump as those which were used for seed. From the results of our past experiments, the indications are that some of the earliest and best varieties of peanuts can be grown to good perfection on the sandy loam soils in the warmest portions of the Province.

Flax (*Linum usitatissimum*).

The cultivation of Flax is carried on more or less extensively in a large number of the countries of the world. It has been grown to a limited extent in Ontario for its seed and for fibre. We have grown three varieties of flax in our experimental grounds during the past three years, namely, the Russian, the Manitoba, and the common Flax of Ontario. These all possess a blue flower and are much similar in character of growth, but there is a considerable difference in the size of the seed; the *Russian* variety being decidedly the largest and the common Ontario variety the smallest. In 1897 and in 1898, it was found that the Russian variety gave the best yield of seed per acre; the average being 15.6 bushels. In 1899. the experiment was not so satisfactory as in each of the two years previous, owing to the lack of the full germination of the seed on account of the exceedingly dry weather at the time of sowing and a second growth occuring after the rains came. In the average results for the three years, the Russian flax still occupies first place in yield of seed per acre.

Hemp (*Cannabis sativa*).

Hemp is supposed to be originally a native of the warmer parts of Asia, its wild locality extending from Syria to the mountains of India, in all of which districts it is met with at the present day in the natural state. It is now to be found both in a wild and in a cultivated state over the milder climates of Europe, over most of which country it is grown for its fibre and for its seed.

The subject of Hemp has not received very much attention in Ontario, but there are some enquires regarding it. Tho following quotation is taken from a letter just received from the vicinity of Leamington, Ontario: "Would you kindly give me what information you can in regard to growing Hemp. Is it grown in Canada, and where, and how is it treated for making rope? Also, do the binder twine factories use it in making twine?' We have done but little experimental work with this crop in our trial grounds. Hemp, however, has been tested in our plots for a few years, and has nearly always made a good growth. In 1899, Hemp grown on low land reached an average height of 56 inches, and that grown on high land reached an average height of 34 inches. The total crop was also considerably heavier on the low than on the high land, the yield in the former case being 3½ tons per acre. As birds are so very fond of the seed, it is difficult to determine the amount produced on the plots. Only eight bushels of seed per acre were harvested in the past season. We hope to give this plant more attention in the future.

Ramie, Rhea, or Rhea Grass (*Bœhmeria nivea*).

Ramie is a Chinese and East India perennial shrub which is said to grow on an average from four to six feet in height. Within the last twenty years it has been grown over a considerable part of the United States, and is said to furnish a large amount of forage of fair quality, which is eaten by all kinds of live stock. It is also grown for its fibre, which is secured from the stem and which is now coming into use for almost every purpose for which cotton is used.

We have sown Ramie in our trial plots for two years, but the germination of the seed has been very poor and the results so far have been quite unsatisfactory. It is quite probable that Ramie will not prove to be a success in Ontario, although we hope to secure seed in the future which will possess greater vitality than that which we have used hitherto.

Chufas, or Earth-Almonds (*Cyperus esculentus*).

The Earth-Almond is often cultivated on rich sandy loams with good success. It is a perennial plant which produces a great many edible tubers. The cultivated variety is a very fine flavored edible nut when well dried or parched. The crop, however, is usually fed to hogs, which are turned into the field and allowed to root up the plants and eat the tubers, which are said to be very rich in fattening properties. In experiments conducted in the growing of Chufas or Earth-Almonds in our experimental department in 1897 and in 1899, we found the plants to grow well. The average yield of the tubers or nuts per acre has been 22.6 bushels.

Field Pumpkins and Field Squashes.

The following varieties of field Pumpkins and field Squashes have been tested in the experimental grounds from one to three years: Rennie's Yellow Mammoth squash, King of the Mammoth pumpkin, Thorpe's Mammoth pumpkin, Mammoth Bright Red Etampes pumpkin, Mammouth Tours pumpkin, Rennie's Green Mammoth squash, Backbee's New Sandwich Island pumpkin, Large Cheese pumpkin, Grey Boulogne pumpkin, Hundredweight pumpkin, True Potiron, Large Mammoth Yellow Chili squash, Mammoth Whale squash, Thorpe's Yankee squash. These fourteen varieties are all advertised as being heavy yielders. The varieties were grown on heavily manured, and also on unmanured, land each year. The yields from the heavily manured land were very large, as compared with those from the land which received no manure. The varieties which produced the largest yields were as follows: In 1895, the King of the Mammoth pumpkin, Rennie's Yellow Mammoth squash, Thorpe's Mammoth pumpkin, Mammoth Tours pumpkins and the Mammoth Bright Red Etampes pumpkin; in 1898, Rennie's Yellow Mammoth squash, Mammoth Bright Red Etampes pumpkin, Thorpe's Mammoth pumpkin, Grey Boulogne pumpkin and Hundredweight pumpkin; and in 1899, Thorpe's Mammoth pumpkin, Large Mammoth Yellow Chili squash, Rennie's Yellow Mammoth squash: Mammoth Bright Red Etampes pumpkin, and Large Cheese pumpkin. Taking the average results for the three years, we find that the *Rennie's Yellow Mammoth Squash* produces

the heaviest yield per acre, that the Thorpe's Mammoth pumpkin comes second, and Mammoth Bright Red Etampes third, and the King of the Mammoth pumpkin fourth.

This information should prove of service to farmers who are growing pumpkins and squashes to feed stock, as the largest yielding varieties of both pumpkins and squashes appear to be of good quality ; in fact, they are frequently used, and are considered valuable for culinary purposes, as well as for feeding to cows and hogs.

Sunflower. (*Helianthus annuus*).

The Sunflower is a tall, erect, stout, rough herb, which is grown more or less over the greater part of North America. Champlain found it growing in Lower Canada, where the natives grew it for the oil which they secured from the seed. The seeds, after being shelled, are said to contain 34 per cent. of oil, of which from 28 to 30 per cent. is said to be superior to both Almond and Olive oil for table purposes ; and it is also used for making soap, candles, and for lighting. The cake which is left after the oil is extracted is used for feeding cattle. In some of the European countries the seed is used as a human food, and also as a food for sheep, pigs, and especially poultry. The flowers are used to produce a yellow dye ; the leaves as a food for cows and also as a fertilizer ; and the stalks for fuel, for fertilizing the land, and for the production of an excellent fibre when treated the same as flax.

We have grown no less than eleven varieties of Sunflowers in the Experimental department, and have found that nearly all the varieties have grown satisfactorily. The *Mammoth Russian* has been grown for seven years with an average total yield of 13.1 tons per acre. The average yield of heads of the Mammoth Russian for six out of the seven years has been 5.1 tons. The Black Giant has been grown for five years in succession, and has surpassed the Mammoth Russian variety in the total yield per acre by 1.3 tons, and in yield of heads per acre by 200 pounds in the average results for the five years. The White Beauty variety has been under experiment for the past three years, but the yield of the total crop and the yield of heads per acre have been less than those of the Mammoth Russian variety. The common Sunflower has given an average of 2½ tons of total crop per acre, and ½ of a ton of heads per acre less than the Mammoth Russian in the three years that these two varieties have been grown under similar conditions. The results of our experiments with Sunflowers up to the present time show that the *Black Giant* has given the largest yield per acre of total crop and also of heads, and that the Mammoth Russian occupies second place in point of yield.

Conclusion.

We have aimed to make all our work practical, accurate and reliable, and we hope that the record of the results here presented may be of some service in the advancement of agriculture in Ontario.

Respectfully submitted,

C. A. ZAVITZ,
Experimentalist.

Ontario Agricultural College,
Guelph, Dec., 30th, 1899.

PART XII.

MANAGER OF THE POULTRY DEPARTMENT.

To the President of the Ontario Agricultural College :

Sir,—I have the honor to submit herewith a brief report of the work, etc., in the Poultry department since the seventeenth of April last, when I commenced my duties as manager of the department.

I beg to thank you for the several improvements that have been made in our equipment during the year, especially the purchase of necessary appliances and the construction of a new incubator and brooder house. After the date at which I was appointed it was not possible to do much in the hatching of chickens. Hence there is nothing special to report under this head.

Summer Layers.

During the past season Brown Leghorns and Andalusians made the best record. The eggs from both varieties are white in color, but those from the Andalusians are much larger. The average weight of a dozen Andalusians was one pound ten ounces, while that of Brown Leghorn eggs was only one pound seven ounces. The great objection to the Andalusians is that they do not breed true to color : some are black, others mottled, and about sixty per cent. blue.

Early Winter Layers.

The Plymouth Rocks, the Wyandottes and the Langshans are doing best. They all lay medium-sized brown eggs, but the Langshan egg is the most uniform in color.

Feeding

Morning ration.—Whole grain (wheat, barley and oats, but chiefly wheat,) scattered in the litter on the floor of the pens, care being taken that it was well mixed with the litter. The quantity fed was usually in the proportion of about one-half handful to each bird.

Noon ration.—Roots, such as mangels, sugar beets, turnips or carrots. About once a week they were cooked by way of variety.

Afternoon ration.—About 3.30 a mash, composed of equal parts bran, barley meal, ground oats, refuse bread and cut clover hay. During cold weather corn meal was given in addition. The clover hay was prepared by placing the amount thought sufficient in a vessel containing boiling water the morning previous, covering and allowing it to steam all day. The fowls were allowed what mash they would eat readily, which was about one quart to every twelve hens. If all the food was not readily eaten it was removed. Whole grain was boiled with vegetables and refuse meat, and fed as a change in the place of mash. After the mash, a small quantity of whole grain was fed in the litter to secure exercise and maintain good health. Cut bone was fed two or three times a week in the proportion of one pound to every fifteen birds. This was usually fed in the evening instead of the mash or the whole grain.

It is necessary to study the surrounding conditions as to convenience, expense, results aimed at, etc., before deciding what method of feeding will give best results.

Artificial Incubation.

Not having a proper incubating room, the manager hitherto has found the results from this method of hatching rather unsatisfactory. The machines have been operated in a small room into which the direct rays of the sun have shone, and the wooden floor of the room has been a thoroughfare from the front to the back of the main poultry building. Hence an uneven temperature, more or less jarring, and a small percentage of chickens.

Artificial Versus Natural Incubation.

Notwithstanding the unfavorable conditions, the percentage of chicks from the machines has been nearly equal to that from the hens, while much less labor has been required to care for the incubator than to look after the hens necessary to cover an equal number of eggs. A few hens have hatched the full percentage, but others have broken several of their eggs, and some have failed to remain on the nest the full twenty-one days.

Egg Preservation.

Several methods of preserving eggs were tried. The eggs for this purpose were taken early in July, and were tested during the latter part of December.

Method No. 1.—A solution was used composed of one part water-glass (sodium silicate) and six parts water. This was as strong a solution as would allow the eggs to sink and might therefore be termed a saturated solution.

The eggs from this solution were superior to all others, especially in flavor.

Method No. 2.—This was similar to that in No. 1, except that eight parts of water were used instead of six parts. These eggs were slightly inferior in flavor.

Method No. 3.—This was composed of ten parts of water to one part water-glass. The eggs from this solution were inferior to those from No. 1 both in flavor and poaching.

The results of these experiments do not coincide with those obtained by my predecessor; hence further work will be necessary before reliable conclusions are reached.

Method No. 4.—A lime solution, made as follows :

Two pounds of fresh lime were slacked in a pail and a pint of salt was added thereto. After mixing, the contents of the pail were put into a tub containing four gallons of water. This was well stirred and left to settle. Then it was stirred thoroughly the second time and left to settle; after which the clear liquid was poured over the eggs, which had previously been placed in a crock or tub. Only the clear liquid should be used.

The eggs from this pickle were inferior to those from the water-glass solution. They had a slight taste of lime.

Method No. 5.—The eggs were immersed in melted vaseline, after which they were packed in egg cases. When broken, the eggs appeared to be well preserved, but they had absorbed the very undesirable flavour of the vaseline.

Method No. 6.—Common salt was used, in which the eggs were placed, small ends downwards; and no eggs were allowed to touch the abjoining ones or the box. Only a small percentage of bad eggs was found; but they had all suffered a good deal from evaporation.

Method No. 7.—Good dry oats were used for this lot, in the same way as dry salt in No. 6. These eggs were musty, and had evaporated fully as much as those in the salt.

Method No. 8.—These eggs were immersed in pure water-glass and dried on a greased board, after which they were packed in an egg case. They were fairly well preserved, but lacked flavor.

This method necessitates a large amount of labor.

Raising Ducks.

Early in June, thirteen Pekin Ducks were hatched. These were divided into lots of six and seven each. Lot 1, six in number, were fed on a mixture of equal parts of bran, shorts, and corn meal, moistened with skim-milk. Lot 2, seven in number, were fed the same mixture, with the exception that the food was moistened with boiling water. After

the ducks were one week old, a small amount of animal meal was added to their ration. Lot 1 during the first six weeks consumed 90 lbs. of the mixture and 90 lbs. of skim-milk. They then weighed 25 lbs., or a little more than four lbs. each. Lot 2, during the same period, consumed 79 lbs. of the grain and 7 lbs of animal meal, and the lot weighed 21 lbs., or three lbs. each.

The following four weeks both lots received the ration which was fed to Lot 1. Both lots gained practically the same amount, the average weight of Lot 1 being six and one-half pounds each, and that of Lot 2, five and one-half pounds each. From this experiment it would appear that there is no advantage in mixing the food with boiling water. Before drawing final conclusions, however, it would be well to bear in mind that this is only one experiment and that it was conducted during a very warm, dry season of the year.

Fattening Chickens.

On October the thirteenth, one hundred and fifteen chickens were placed in small coops for fattening. They were carefully weighed when cooped, and again after being fed for five weeks, and the gain noted. Those of pure breeds and high crosses, representing the Plymouth Rock, Wyandottes, Brahma, and Langshan breeds, made an average gain of nearly two and one-quarter pounds each. Those representing the ordinary barnyard fowl gained only about one and three-quarters pounds each. Both lots received the same kind of food, and the general treatment was identical in every particular.

Feeding.—They were fed on a mixture of 3 parts of finely ground oats and one part buckwheat meal, moistened with skim-milk and placed in small V-shaped troughs arranged in front of the coops. They were given grit once a week and also a small feed of green cut bone. The bone appeared to have particular value in keeping the birds healthy. They were fed from the trough for four weeks, after which they were fed by means of the cramming machine for ten days. The food used in the machine consisted of very finely ground oats and skim-milk, to which was added about one pound of tallow for every seventy birds. They were allowed all the water they would drink. During the period of five weeks, the one hundred and fifteen birds consumed 910 lbs. of oats, 305 lbs. of buckwheat, 900 lbs. of skim-milk, and 9 lbs. of tallow; and the total gain in flesh was 216 lbs.

Killing.—The birds were fasted thirty-six hours, in order to empty the crop and intestines before killing. They were killed by dislocating the neck and were immediately dry-picked. There is less work and less risk of tearing the flesh, if the plucking is done while the bird is warm.

Preparing for Market.—After being plucked the fowls were placed on the shaping board, which consists of a board about six inches wide fastened to the wall or other suitable board at an angle of about 65 degrees. As soon as plucked, the chicken was placed on this board or trough, the legs being laid alongside the breast, and the stern pushed against the wall. The breast was kept downwards and pressed into the shape of the trough by placing a glazed brick or other weight on top. When birds are left in this shape it gives them a more compact appearance and allows the blood to drain into the neck. The chickens were placed side by side in the trough and allowed to remain until thoroughly cool, when they were packed for shipment.

The crates used for packing were 33 inches long by 19 inches wide and 6½ inches deep, and usually held twelve birds. The ends and centre of the boxes were one inch thick; the remainder of the box was five-eights of an inch thick. The fowls were graded as to size. Before packing the bird should be wrapped in the best parchment paper, the neck and head projecting at one end and the feet at the other.

Feeding for Color.—Six grade Plymouth Rock pullets (full sisters) were divided into two equal lots. One lot was fed on a mixture of finely ground oats and buckwheat, which was moistened with skim-milk; the other lot was fed on yellow corn, moistened with water. They were fed in this manner for eleven days, when they were killed and dressed. Those on the oat and skim-milk ration presented a creamy white appearance, while those fed on the yellow corn were of a deep yellow color. It will thus be seen that it is possible to supply customers of opposite tastes in regard to the color of flesh, from the same breed of fowl, by feeding different kinds of food.

Cramming Machine.

In forcing fowl for the British market, some feeders in this country and many on the other side of the Atlantic use a cramming machine during the last nine or ten days of the feeding period. Birds cannot stand it much longer.

For the information of those who have not seen such a machine I submit the following cut and description of the one which we use :

The crammer consists of a food reservoir, to the bottom of which is attached a small force pump actuated by a lever a d treadle worked by the foot of the operator.

Cramming Machine.

Communicating with the pump is a nozzle, through which the food passes to the bird. A is the food reservoir. B the pump. E the pump rod. O is the lever which, on being depressed at the lettered end, causes the pump rod E, to which it is attached, to move downwards and to eject the contents of the pump B out at the nozzle K. On relieving the pressure at O, the lever and the parts connected therewith are drawn up by the spring C, until a motion is arrested by a stop M, which serves to determine the the quantity of food ejected at each depression of the treadle.

The charge may also be varied by arresting the pressure at any point in the downward thrust of the lever O.

The method of operating is as follows : Take the tube of the cramming machine in the right hand and the bird's head in the left, then with the assistance of the finger and thumb of the right hand, open the bird's mouth and slip the forefinger of the left hand into it and hold down the tongue,, quickly insert the end of the tube and push it down seven or eight inches, (according to the size of the bird), at this moment depress the right foot (which up to this time has been resting on the treadle) and force the contents of the cylinder into the bird's crop. If the crop be full enough the tube may now be withdrawn, taking care, however, to relieve the pressure on the treadle for a second or two before taking the tube out, otherwise a small quantity of food will continue to flow after the tube is removed. When not in use hang the nozzle over the edge of the food reservoir.

The advantages gained by using the cramming machine are :

(1) Birds can be made much fatter by the use of the crammer than by feeding in the ordinary way.

(2) The quality of the flesh is improved ; it is made more juicy and tender and is improved in flavor.

(3) The general appearance of the bird is improved, which is an advantage in the market.

The disadvantages are :

(1) The present cost of the machine is too high for general use. The machine for this department cost nearly thirty-five dollars. This price includes freight and duty.

(2) More labor is required in caring for the fowls when the machine is used.

(3) Inexperienced persons are apt to strangle birds by giving them too much feed or by failing to operate the machine according to directions.

(4) As a rule, ground oats require sifting before they are suitable for use in the machine, and many are so situated that they cannot get the very finely ground article.

Since writing my report, I have received from Mr. Ruddin, of Liverpool, an important communication regarding packages and the method of packing poultry for export. I believe the information given in the following letter to be of special value, considering that it comes from one of the largest and most successful dealers in England.

Liverpool, Jan. 6th, 1900.

DEAR SIR :

Owing to the disarrangement of the postal service by the "war" I have not been able to communicate with you earlier.

Your poultry is very fine ; well fed and properly handled ; and the only points on which you failed to make a complete success of your initial venture, were the packing and the cases used.

When packing your poultry in the future, use for wrapping purposes the best parchment paper obtainable. Do not on any account put straw in any of the cases, as it will attract and hold moisture and will in consequence make your birds clammy, which it did in the present lot.

If you use parchment paper and carefully cover each bird, nothing else is necessary. If the box is too large for a dozen birds, put in thirteen, fourteen, or fifteen, but always fill it up. Do not make up space by using paper, excelsior or straw.

The cases used were only suitable for hard frozen poultry, for which purpose it is desirable to have the box as nearly airtight as possible. On the other hand, chilled poultry requires cases made with inch openings left between each board that goes to make up the top, bottom, and sides.

Yours truly,

JAS. RUDDIN.

I may add that the brown paper used for wrapping was the same as that recommended by Prof. Robertson, and the boxes were made of well seasoned wood, with half inch openings between the boards. No doubt the dampness caused them to swell so as to bring them nearly together.

ONTARIO AGRICULTURAL COLLEGE,
GUELPH, Dec. 30th, 1899.

W. R. GRAHAM,
Manager Poultry Department.

PART XIII.

LECTURER ON APICULTURE.

To the President of the Ontario Agricultural College:

SIR,—Herewith is submitted for your consideration my first report of the department of Apiculture.

This report, in view of the fact that I was appointed in November merely to deliver a short course of lectures occupying less than a month's time, must necessarily be confined to the work done during that period. Replying to your memorandum specifically:

I delivered 18 lectures to each division, viz., A and B, of the First Year. The lectures dealt with the following divisions of the subject:

1. Physiology of the honey bee.

2 and 3. Explanation of brood rearing.

4. The handling of bees and description of the various conditions in which colonies are expected to be found in the first week or so of May.

5. Fertile workers. Introducing queens. Building up by stimulative feeding and spreading of brood.

6. Spring flowers useful for building up. Poisoned, chilled, and foul brood.

7. The prevention of early swarming by giving ventilation and room. Returning early swarms.

8. Buying and moving bees. Preparing for clover flow. The commercial honey plants.

9 and 10. Swarming.

11, 12, and 13. The taking of extract and comb honey.

14. Storage and marketing of honey.

15. Construction of hives and appliances by bee-keepers. Building up, uniting and feeding back for wintering.

16. Cellar wintering.

17. Outside wintering. Queen rearing.

18. Resumé of the essentials of successful bee-keeping, giving each its relative importance.

Of course, there was no practical work in November or December.

From the nature of the subject I have been able to follow only in part note 3 of College Circular, p. 23. I have set a written examination in Apiculture.

Far more interest was shown in the lectures than I had expected to find. Many of the students had dabbled more or less with bees at home and were eager to obtain the information necessary for the scientific management of an apiary. From the questions asked, I should judge that they were acquiring the details with considerable accuracy. Of the remainder who had had no experience whatever with bees, several were indifferent, but the great majority really sought information. It did not appear at all to be forced upon them. Some have a pretty clear conception, and others more or less hazy impressions, on this subject, according to the capacity and interest of the student.

I have, in these lectures, detailed a simple and scientific system of bee-keeping, taking up the conditions of colonies in the beginning of the season and following them through the year; I showed what operations were to be performed and what difficulties were to be met with at each part of the season. I avoided as far as possible the division of the subject into chapters, after the manner of books, but have followed the same order as if I were handling an apiary from the beginning of the season to the end. If a student has taken full notes, he may with considerable confidence assume the responsibility of managing a few colonies during his first season. He will have at his command the little hints and scraps of information not to be found in books, and which may not be obtained in perhaps ten years' experience. The student must acquire facility in managing an apiary by several years' experience. This cannot be obtained here unless a large apiary is maintained on the Farm and the students remain at the College during the summer months.

I have furnished information to correspondents, and expect to conduct some experiments in my own apiary during the coming summer.

Respectfully submitted,

H R ROWSOM.

GUELPH, December 18th, 1899

PART XIV.

COLLEGE PHYSICIAN.

The President of The Ontario Agricultural College:

SIR,—A few days ago I received from you a communication requesting me to present my report for the year now ending. In performing this duty I need not make any observations to you on the marked increase of attendance at the College, with its consequent addition to the work of the physician.

You are aware that during the early part of the year the weather was exceptionally severe, and that in this section of the Province at least an unusual proportion of the population suffered from sickness, and that this condition of the public health applied to the College. In addition to the minor accidents and the many forms of slight ailments with which we had to deal, I regret to say that there occurred among the students a number of cases of rather grave illness, requiring treatment in the hospitals of this city, where under the excellent nursing of these worthy institutions all recovered: I might mention among such cases, one of pneumonia, on of severe septicaemia, one of appendicitis, and one of fracture of lower jaw.

On the occasion of my annual inspection of the College premises I noted with pleasure the improvement in the heating of the more exposed bed-rooms which are further protected from cold by outside or storm windows with an aperture in the bottom of the sash for purpose of ventilation. In these rooms the warmth is now all that can be desired, but I am not sure that the ventilation is adequate.

Another matter concerning the health of the students came under my notice at that time. I refer to the condition of the swimming bath—to the need that exists there, for renewal of the present flooring or its replacement by something more suitable, for some means of preventing students from coming in contact with the heating pipes and for improved ventilation and admission of more light. In my opinion, swimming as an exercise is not fully appreciated and should be encouraged, and in connection with this matter I respectfully suggest that there be placed in conspicuous places about the bath illustrations of the best means of rescuing the drowning and resuscitating the apparently drowned.

In closing my report I am glad to say that the general sanitary condition of the College is excellent.

Respectfully yours,

W. O. STEWART,

College physician.

GUELPH, Dec. 30, 1899.

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